6 July 2026

Dear Industry Stakeholder

Request for Consultation and Feedback

Draft Fire Safety Guideline GL-31 – Use of Lifts for Evacuation

Fire Rescue Victoria (FRV) is pleased to release the public consultation draft of Fire Safety Guideline GL-31 (Version 3) and invites industry feedback.

The updated draft guideline outlines FRV's position on the use of lifts as a supplementary means of evacuation in multi-storey buildings.

It reflects input from industry stakeholders, including engagement at the 2025 Fire Australia Conference, and seeks to improve understanding of technological advancements that support both occupant evacuation and fire brigade intervention.

FRV welcomes feedback on the draft guideline, particularly regarding:

- Clarity and usability
- Practicality of the proposed approach and recommendations
- Potential impacts on industry operations and compliance activities
- Areas where further guidance or clarification may be beneficial.

Please submit your written feedback, including any supporting information or examples, by close of business on 14 August 2026 to BSR.Admin@frv.vic.gov.au

All submissions will be considered in the development of the final guideline. While not all suggestions may be adopted, stakeholder feedback will play an important role in informing the final document.

We appreciate your time and contribution to this consultation process.

For enquiries, please contact Mr Tass Georgas at Tass.Georgas@frv.vic.gov.au or 0408 887 153.

Yours faithfully,

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Use of Lifts for Evacuation

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Fire Rescue Victoria

Guideline No. 31
Author: FSSPR Unit
Sponsors: Fire Safety and Built Environment Departments
Authorised by: Director, Fire Safety

1 PURPOSE

The purpose of this guideline is to communicate to industry Fire Rescue Victoria's (FRV) position on the use of lifts for evacuation within a multi-storey building.

FRV also intends that this guideline be considered in conjunction with the Australian Building Codes Board's (ABCB) Lifts Used during Evacuation Handbook, 2013 [1].

2 SCOPE

This guideline is applicable to prospective Class 2-9 multi-storey building designs and existing buildings and that are situated within the FRV fire district that utilise or propose to utilise lifts as a supplementary means of evacuation.

Importantly, the adoption of protect-in-place strategies or the adoption of evacuation strategies that promote the use of lifts that function as the primary means of evacuation, are not within this guideline's scope of consideration.

3 DEFINITIONS AND ABBREVIATIONS

For the purpose of this guideline, the following definitions and abbreviations will apply.

FRV fire district has the same meaning as Section 4 of the *Fire Rescue Victoria Act 1958* [2].

National Construction Code 2025 (NCC) refers to the National Construction Code Series, Volume One – Building Code of Australia (Class 2 – Class 9 Buildings) [3].

PBDB: Performance based design brief.

Performance Solution maintains the same definition contained within Schedule 1 of the National Construction Code 2025.

Safe place maintains the same definition contained within Schedule 1 of the National Construction Code 2025.

4 BACKGROUND

In 2005, FRV's legal predecessor, the Metropolitan Fire and Emergency Services Board (MFB), first published fire safety guideline GL-31 [4], following the number of conceptual design proposals that industry had developed and presented to MFB, to address the increased need for multi-storey buildings to provide better and more equitable evacuation opportunities for those occupants who use them, whom may have varying degrees of mobility. The 2005 edition of guideline GL-31 (Version 1) and subsequent

versions of this guideline also embedded significant technological considerations that supported fire brigade intervention.

Reflecting on past and more recent experiences in responding to incidents that necessitated a full evacuation, FRV is aware that the evacuation of high-rise buildings, which include residential apartment buildings and highly populated office buildings, can take upwards of an hour or more. FRV continues to acknowledge that traditional evacuation strategies that rely on the use of fire-isolated stairs, have notable limitations, as they do not offer equitable evacuation opportunities for all occupants who use them.

Consequently, with the number of high-rise buildings being constructed throughout Victoria increasing on a regular basis, FRV is supportive of design proposals that provide appropriate, supplementary methods of access and egress, which best support the occupants who live and use these buildings.

The position that was consistently communicated within previous versions of GL-31, reflected that the use of lifts for evacuation should only be considered within a fully sprinkler protected building that is provided with supportive infrastructure, e.g., protected lobbies and lift shafts, reliable power supplies, etc., and where trained fire wardens and an appropriate emergency management structure is in place. Whilst this position continues to be supported by this guideline, FRV acknowledges that within many Class 2 residential buildings, alternative emergency management arrangements will need to be considered, particularly where the implementation of trained fire wardens may not be practical.

5 COMPLIANCE WITH NCC

5.1 Consideration of the NCC and the ABCB's Handbook

Within the Victorian environment, multi-storey building designs that intend to use lifts for evacuation, must comply with Performance Requirement D1P7 of the NCC, which is indicated below.

D1P7 **Evacuation lifts**

[2019: DP7]

Where a lift is intended to be used in addition to the *required exits* to assist occupants to evacuate a building safely, the type, number, location and fire-isolation must be appropriate to—

(a) the travel distance to the lift; and
(b) the number, mobility and other characteristics of occupants; and
(c) the function or use of the building; and
(d) the number of *storeys* connected by the lift; and
(e) the *fire safety system* installed in the building; and
(f) the waiting time, travel time and capacity of the lift; and
(g) the reliability and availability of the lift; and
(h) the emergency procedures for the building.

As there are no corresponding deemed-to-satisfy requirements within the NCC, which specifically address the use of lifts for evacuation, designers are strongly encouraged to consider the ABCB's Handbook, when developing a reliably informed Performance Solution to satisfy the requirements of the NCC.

In preparing a Performance Solution, representatives of the design team are first expected to develop a PBDB during the conceptual design phase of a project, and consult with relevant stakeholders, which include FRV, representatives of the lift industry and the building's end-users. It is FRV's view that consultation with FRV as part of preparing the PBDB for the building that proposes to use lifts for evacuation is essential to achieving compliance with Performance Requirement D1P7 (h). When the PBDB has been agreed to by all of the relevant stakeholders, the design team can proceed to the design development phase and prepare the technical report(s) that comprise the Performance Solution.

Whilst the ABCB Handbook provides guidance to industry when developing a Performance Solution that enables the use of lifts for evacuation, FRV reaffirms its position that the use of lifts for evacuation should only be considered within a fully sprinkler protected building, where trained fire wardens and an appropriate emergency management structure is in place.

5.2 Development of the Performance Solution

In developing a Performance Solution for a building that seeks to use lifts for evacuation, FRV advocates that a holistic approach to fire safety design should be adopted by all members of the design team, which ensures that the entire building solution is not adversely impacted. Additionally, where a PBDB is to be prepared, FRV affirms that it is a relevant stakeholder and recommends that stakeholder consultation is facilitated in the building's conceptual design phase, consistent with the expectations of Clause A2G2(4)(a) of the NCC, which ensures that all the pertinent matters are addressed in the development of an evacuation strategy that forms part of the PBDB.

To support an expeditious review of the developed PBDB, FRV advocates that the PBDB clearly address the following matters, which are critical to a Performance Solution that intends to use lifts for evacuation.

(a) The identification the project's objectives, which necessitate the multi-storey building's use of lifts for evacuation;

(b) The identification of the fire safety system redundancies that are proposed by the (conceptual) design;

(c) The provision of detailed commentary that considers all aspects of the guideline, which is supported by evidence;

(d) The provision of the written support and endorsement of the design by the lift programmer and lift manufacturer;

(e) The identification of comprehensible and achievable commissioning measures, which can be reliably repeated at periodic intervals, post occupation that align to the building's essential safety measures obligations; and

(f) The identification of suitable management-in-use procedures that will complement the Performance Solution's adopted evacuation strategy, i.e., the staging of evacuation drills, the delivery of emergency control organisation (warden) training, building induction procedures, etc.

6 CONSIDERATION OF PUBLISHED TECHNICAL REFERENCE DOCUMENTS AND OTHER INTERNATIONAL STANDARDS

A small number of technical reference documents and standards have been published since the first version of GL-31 was published. Alongside the ABCB Handbook, the NIST Technical Note 1825 *"The Use of Elevators for Evacuation in Fire Emergencies in International Buildings"* [5], Section 3008 of the 2021 International Building Code (IBC) [6] and the White Paper of Thompson *"Using lifts during a fire – An evacuation design guide"* (White Paper) [7], are three prominent documents that may be considered by designers when developing a Performance Solution.

6.1 Section 3008 of the IBC

Within many North American jurisdictions and a small number of jurisdictions within West Asia, the prescriptive provisions of Section 3008 of the IBC must be complied with when elevators are used for occupant self-evacuation during a fire.

Although it is not intended that the IBC's prescriptive provisions be discussed within great detail within this guideline, summarily, the prescriptive provisions provide for the implementation and installation of—

- An approved fire safety and evacuation plan;
- Automatic sprinklers, including the protection of the lobby areas from water infiltration;
- Elevator recall operations and preventative shutdown measures;
- Specific construction requirements for occupant evacuation elevator lobbies, elevator shafts and interfaced exits;
- Elevator system monitoring;
- Specific electrical power measures;
- Emergency voice and alarm communication system requirements; and
- The exclusion or the limitation of hazardous materials within the building.

6.2 NIST Technical Note 1825

The NIST Technical Note 1825 (Technical Note) is a concise document that considers current evacuation research for mobility impaired occupants as well as suggesting contemplating the need for additional research and education measures.

In relation to existing research, it identifies—

- Evacuation strategies that are used by design teams globally to support the evacuation of mobility impaired occupants;
- The limitations of elevators and escalators, including the cessation of their use when smoke or fire is detected within adjoining lobbies, machine rooms and shafts;
- The two phases of emergency use, i.e., emergency recall operations and emergency in-car operations; and
- The challenges that mobility impaired occupants face when attempting to self-evacuate.

The Technical Note examines the adopted evacuation strategies of five (5) ultra-tall high rise buildings that have been constructed within the Middle East, Asia, UK and Australia,

where the use of lifts to evacuate these buildings is relied upon. It also identifies whether specific evacuation procedures have been developed or implemented, to support those mobility impaired occupants who are attempting to self-evacuate or seek assistance to evacuate. Within two (2) ultra-tall high rise buildings situated in Asia, it considers the role of emergency elevators, which are dedicated to supporting the activities of responding firefighters and the assisted evacuation of mobility impaired occupants. The role of protected lobbies and refuge floors is also discussed alongside the use phased evacuation and the operation of sophisticated emergency communication and annunciation systems.

The Technical Note discusses the limited consideration of human factors within current building standards and reviewed evacuation strategies, which relate to the use of lifts for evacuation. The discussion identifies matters relating to the evacuation of mobility impaired occupants, which are briefly summarised below.

- Being aware that the use of lifts and the presence of protected lobbies or refuge areas, have been provided to support their ability to safely evacuate the buildings that they occupy, in the event of an emergency;
- Maintain a degree of readiness to use the lifts, including waiting within protected lobbies or refuge areas, prior to evacuating, noting that consistent community education discouraged the use of lifts during an evacuation;
- Understanding that the provision of assistance to evacuate is likely to occur, albeit within a prioritised context, i.e., identifying the floor level(s) that will need to be evacuated first, the provision of valuable information to persons congregating within the protected lobby or refuge area, when will assistance arrive and the time to board the lift;
- Addressing perceptions that may arise from hearing and/or visibility impairments, which may impact further reduce mobility;
- The development of evacuation strategies that enable a socially connected and supported evacuation, i.e., family members, “buddy” networks, work colleagues within an emergency control organisation, evacuating in a pre-planned and connected manner; and
- The provision of clear and unambiguous messaging to those occupants of a building who need to use lifts to evacuate, so as to minimise the likelihood of stress and anxiety being experienced by mobility impaired occupants.

With the limited availability of data, the Technical Note suggests that additional research on evacuation strategies for mobility impaired occupants is needed, with a focus on the following considerations.

(i) Are mobility impaired occupants aware of the possibility of using elevators for evacuation during a fire emergency?
(ii) What are mobility impaired occupants’ attitudes towards the use of elevators for evacuation during a fire?
(iii) How willing are mobility impaired occupants to use elevators for evacuation during a fire?
(iv) What are mobility impaired occupants’ decisions and behaviours during evacuation for a fire emergency?
(v) Are there concerns of mobility impaired occupants using elevators during fire evacuation? If so, what are these concerns?

Through a literature review, the Technical Note identifies four (4) beneficial measures that should support the use of lifts for occupant evacuation, for all occupants. These beneficial measures encompass the provision of education, the existence of clear and unambiguous signage, the provision of real time information, and the delivery of regular training and awareness.

6.3 White Paper of Thompson *"Using lifts during a fire – An evacuation design guide"*

The White Paper of Thompson *"Using lifts during a fire – An evacuation design guide"* (White Paper) explores design considerations following the construction of an ultra-tall high rise building in Melbourne that uses lifts for evacuation.

Initially, the White Paper provides a perspective as to why lifts are not traditionally considered in the design of buildings. It also provides a statistical reflection on the number of people within Australia who rely on mobility aids and the challenges that they would face should they need to evacuate in the event of an emergency. The White Paper subsequently discusses the limitations of the NCC, which acknowledges that a Performance Solution needs to be developed as there is no prescriptive solution that designers can refer to when developing a conceptual design.

The White Paper identifies three objectives that support the use of lifts for evacuation, which are briefly discussed below.

(a) Ensuring occupant safety while they wait for a lift.

This objective focuses on the establishment of a protected refuge or lobby area adjacent to the lifts. To support this objective, lift programming should prioritise the needs of the occupants who are at the highest risk, i.e., their proximity to the fire.

(b) Ensuring occupant safety while they evacuate via the lift.

This objective emphasises on the importance of controlling smoke movement into the lift shaft, which is intended to prevent smoke movement into other, non-fire affected areas of a building. The objective also encompasses lift back-up power supplies, emergency control organisation training, visual and/or auditory communication before and during lift transit and effectively informing occupants to provide them with the confidence to use lifts to evacuate.

(c) Ensuring occupant safety between discharge of the lift to the building exit at the level of egress.

This objective is concerned with the occupants' journey to safely reach the road or open space, once they have disembarked the lift. The pathway to reach the road or open space must again be via a protected lobby or passageway that is maintained clear of unnecessary fuel load, which may compromise the final part of the occupants' evacuation. The use of sophisticated lift programming is encouraged, particularly where smoke or other hazards are detected at the proposed level(s) of discharge, so that occupants can disembark at another safe location within the building.

7 CONSIDERATION OF FIRE BRIGADE INTERVENTION

When developing a Performance Solution, FRV strongly encourages the consideration and implementation of the following design matters.

(a) **Number of lifts** – Where possible, the number of lifts to be provided must facilitate both the evacuation of occupants, as well as firefighter access, with at least one of those lifts dedicated for firefighter use.

(b) **Installation of Closed Circuit Television (CCTV) infrastructure** – The installation of CCTV infrastructure within a fire control room or at the fire control centre, provides responding firefighters with the knowledge of how many occupants are attempting to use the lifts for evacuation, which assists with their search and rescue functions.

Note: Please refer to Appendix A of this guideline, which identifies the specific CCTV requirements applicable to the monitoring, power supply, electrical cabling and firefighter control requirements of this guideline.

(c) **Dedicated emergency lift** – Where an emergency lift is provided, it is to descend to the ground floor upon the activation of a fire alarm. Thereafter, the use of the lift should only be operated by firefighters or other emergency services responders, via the use of a key.

(d) **Lifts control panels** – All lifts should be provided with firefighter lift controls, as well as recall facilities. The lifts, once under the control of firefighters, would be operated from within the lift car.

(e) **Lift safety and security features** – Any lift security mechanisms that are implemented by the building's design team, must be able to be overridden when the lift car is in fire service mode. The provision of a means of communication, and/or the provision of a visual indicator within the lift car, which identifies that smoke has entered the destination lift lobby, whilst firefighters are travelling in the lift car is also encouraged. Visual indication of the status of the lifts from within the fire control room, where practicable, is similarly encouraged.

8 MANAGEMENT IN-USE CONSIDERATIONS

It is the expectation of FRV that designers also assist building owners and their appointed representatives immediately prior to and during the initial stages of a building's occupancy, where the use of lifts forms part of the evacuation strategy. Assistance in the development of specific building management procedures, the preparation of a building manual and coordinating the delivery of practical building use demonstrations, are examples of some measures that prepare building owners and building occupiers with a more fluent and informed transition into their buildings.

Alongside the measures that are developed by the buildings' designers, the ABCB Handbook identifies another series of measures that supports the building owner and their appointed representatives, in establishing and maintaining a safe environment for the buildings' users. These measures are briefly outlined below.

- The development of an emergency plan, including the establishment of an emergency control organisation (ECO), in accordance with Australian Standard

3745 – 2010 *"Planning for emergencies in facilities"* [8] and Australian Standard 4083 *"Planning for emergencies – Health care facilities"* [9].

- The development of personal emergency evacuation plans (PEEPs) in accordance with AS 3745 for occupants requiring assistance in evacuation.
- The appointment of a chief warden and other wardens, including the delivery of training to these people and other key people within the building, who have a role within a building's ECO, which encompasses the safe evacuation of people using lifts.
- Ensuring that the operational response activities of responding firefighters, are appropriately facilitated when responding to emergency incidents within buildings that permit the use of lifts for evacuation.
- The conduction of routine essential safety measures maintenance, consistent with the expectations of Australian Standard 1851 – 2012 [10] and any specific design or Performance Solution outcomes.

Additional design features that concurrently support a building's management in-use considerations and fire brigade intervention, are briefly discussed below.

(a) **Appropriate signage**

The provision of signage that is displayed within all refuge locations and lobby areas that provide access to the lifts and stairs, which contain simple and concise emergency evacuation procedures for the building's occupants to follow during an emergency that necessitates an evacuation.

Additionally, the implementation of software controls and the provision of physical signage adjacent to the lift's control panel is firmly encouraged, to prevent maintenance personnel from reprogramming or resetting the lift sequence back to an ordinary setting.

(b) **Emergency information procedures provided to all building occupants**

Building occupants are to be informed of the procedures and safety systems that are in place, which facilitates the use of lifts in an emergency.

(c) **Regular scheduled training**

The delivery of training and the conduction of regular familiarisation exercises for those who are expected to use the lifts in a fire emergency (including occupants, firefighters, etc.,) must be undertaken for the life of the building.

(d) **Visual indication**

Appropriate visual indicators should be provided on each floor so that ECO members (fire wardens), building occupants and firefighters are provided with concise real time information relating to the status of each lift.

(e) **Communication measures**

Communication measures, such as the use of fixed telephones, should be provided within the lift to allow the users of the lift to communicate with firefighters, other emergency services responders and/or building managers.

(f) **Maintenance**

The down time associated with the servicing of a lift that is in fault and/or the conduction of routine maintenance of lifts, must be carefully considered in relation to the impact it may have on a building's evacuation strategy. The management of fuel loads, which includes the removal of extraneous items from within lift lobbies, refuge areas and other paths of travel to exits, should also form a part of the building's routine maintenance regime.

9 REFERENCES

[1] Australian Building Codes Board, "Lifts used during an evacuation – Handbook (Non-mandatory document)", 2013, Canberra.

[2] *Fire Rescue Victoria Act 1958* (Vic.).

[3] Australian Building Codes Board, "National Construction Code Series, Volume One – Building Code of Australia (Class 2 – Class 9 Buildings)", 2022, Canberra.

[4] Metropolitan Fire and Emergency Service Board, Fire Safety Guideline GL-31 "Use of lifts for evacuation" (Version 1), 2005, East Melbourne.

[5] National Institute of Standards and Technology, "NIST Technical Note 1825 -- The Use of Elevators for Evacuation in Fire Emergencies in International Buildings", 2014, Gaithersburg MD (USA).

[6] International Code Council, "International Building Code 2021 – Section 3008", 2021, Washington DC (USA).

[7] Thompson, A., "Using lifts during a fire – An evacuation design guide", 2020, South Yarra.

[8] Standards Australia (Committee FP-017), "Planning for emergencies in facilities" (AS 3745-2010:2018 – Inc. Amendment 2), Sydney.

[9] Standards Australia (Committee HE-026), "Planning for emergencies—Health care Facilities" (AS 4083:2010 – 3rd Edition), Sydney.

[10] Standards Australia (Committee FP-001), "Routine service of fire protection systems and equipment" (AS 1851:2012 – Inc. Amendment 1:2016), Sydney.

APPENDIX A

SPECIFIC CCTV PROVISIONS OF GL-31.

A1. Installation settings

Where CCTV infrastructure is proposed to be provided in a building that is designed to support the use of lifts for evacuation, the control console(s) and any monitors or video walls forming part of the CCTV infrastructure, should be installed within an appropriately sized fire control room that satisfies the requirements of 'Specification 19 – Fire Control Centres' of the NCC.

Within buildings where a fire control room is not present, CCTV infrastructure shall be installed immediately next to a fire control centre that incorporates tamper resistant measures, which prevent unauthorised access to the monitors and the use of the CCTV control console(s).

A2. CCTV coverage locations

When installed, CCTV coverage is to be provided to monitor—

a) All lift landings situated within protected lobbies or refuge areas;

b) Lifts cars;

c) Each level of the fire isolated exit stair that provides re-entry, consistent with the expectation of Clause D3D27 of the NCC, i.e., at every 4th floor; and

d) At the point of discharge of the lift car(s) on the ground floor level or any other level that provides a direct exit route to the outside, i.e. the safe place.

A3. System monitoring objectives

The selection and installation of cameras, monitors and/or a video wall technology, which form part of the CCTV infrastructure, shall be programmed to provide an unobstructed, fixed field of view of the coverage locations.

The adopted CCTV infrastructure should provide a real time display within the fire control room that provides succinct information to the attending firefighters, i.e., the provided information enables the attending firefighters to know which lifts should not be interrupted as they are running in evacuation mode.

A4. Power and cabling provisions

The CCTV system is to be connected to essential power that utilises fire rated cabling and be provided with a reliable back-up power supply that ensures the system remains operational for the duration of the building's modelled evacuation period.

APPENDIX B

GL-31 v2 (2017) – Superseded.

Use of Lifts for Evacuation

Approval level: Fire Safety
First issued: December 2005
Review date: February 2017
Version number: 2

1. PURPOSE

The purpose of this guideline is to provide advice to industry on the use of lifts for evacuation. It also serves as a document for operational firefighters to refer to when becoming aware of the issues that may affect their standard operational procedures.

2. SCOPE

This document details Fire Rescue Victoria's (FRV) opinion regarding the use of lifts for evacuation and firefighter access. It outlines the considerations that FRV believes are required to be adequately addressed when an alternative solution incorporates lifts into an emergency management strategy. The guideline considers the design, construction, commissioning, maintenance and management of lift systems for the full life cycle of a building.

Reference should be made to FRV Fire Safety Guideline *GL-07 – Single Fire Isolated Stair in High Rise Buildings* if the use of lifts for evacuation is to be designed in conjunction with a single exit.

This guideline should also be read in conjunction with the Australian Building Codes Board's (ABCB) *Lifts Used during Evacuation* Handbook, 2013.

3. BACKGROUND

FRV has traditionally been supportive of designs which provide equitable evacuation opportunities for all occupants of a building. The use of lifts in a fire emergency prior to the arrival of firefighters is one concept that goes against the prescriptive deemed-to-satisfy requirements of the Building Code of Australia (BCA), and as such, requires careful consideration, proof and demonstration to ensure that any potential modes of failure are identified and adequately addressed. It is also the opinion of FRV that the use of lifts for evacuation should only be considered within fully sprinkler protected buildings, where trained fire wardens and an appropriate emergency management structure are in place.

Whilst FRV is appreciative of the benefits associated with the use of lifts for evacuation, FRV considers that the use of lifts should only be used to compliment an evacuation strategy that concurrently considers the use of fire isolated stairwells as a means of egress.

Since the development of this guideline, the ABCB published a non-mandatory document, *Lifts Used during Evacuation* Handbook, 2013. It is stated in the handbook, which is also in line with this document, that; "*the objective of safely using lifts for evacuations is not intended to diminish the importance of other evacuation measures, including exits, and it is not intended to reduce the number of exits, in particular the number of stairways"*.

In the National Construction Code (NCC), Section D, *Access and Egress of Performance Requirement DP7*, has been introduced which states: What DP7 does not specifically state is that it does not list 'Fire Brigade Intervention' specifically as a consideration; however it is considered that Fire Brigade Intervention may be considered within the emergency procedures for the building.

The examination of data by FRV has identified a number of issues that are associated with lift functionality during a fire incident or other related emergency. The issues outlined in previous FRV Fire Safety Guidelines, *GL-31 – Use of lifts for evacuation* (Version 2, 12 April 2016) and *GL-07 – Single-stair high rise building solutions* (Version 4, 9 August 2005), have been re-examined and further expanded on within this guideline.

4. LIFT SYSTEM CONSIDERATIONS

Prior to the development of any project that aims to incorporate the use of lifts into the life safety system of a building, the limitation of the lift systems and their associated control equipment must be understood and addressed. Liaison between the lift industry and the Australasian Fire and Emergency Service Authorities Council (AFAC) has identified the functions that can and cannot typically be performed by a lift. Such functions, as indicated by the lift industry and outlined below, should be addressed through consultation with the lift designer and manufacturer as part of the analysis of any solution incorporating the use of lifts.

Typical functions lift systems **can** perform are:

- carry their rated loads at contract speed
- run from bottom to top floor in a prescribed time
- communicate with the outside for assistance
- provide emergency lighting in a car in the event of a power failure
- bypass a floor if fully loaded
- know when to open or close doors
- protect door openings to stop doors closing on person/s
- facilitate special fire services control, provided the keys are available
- switch to emergency power, provided it is available
- detect an earthquake of a magnitude that could cause harm
- bypass security systems when on fire service control
- provide information as to the lifts location within the lift shaft.

Typical functions that lift systems **cannot** perform:

- run when overloaded
- run when any door is open or has a faulty contact/lock
- run if doors are distorted by fire
- run if water is in the pit above a certain level
- run if safety gear has operated
- run if there is insufficient power available
- run if door damage effects locks
- run if the machine room temperature is excessive
- run if the lift is under repair
- decide who should use the lift.

Based on these identified limitations, it is FRV's opinion that lifts alone cannot be relied upon to facilitate firefighter access and occupant evacuation in a building.

When the lifts are utilised in an alternative solutions' evacuation strategy, the design team will need to establish specific performance criteria that must be achievable whilst the building is occupied. Similarly, the design team will need to establish evacuation procedures that will complement the alternative solutions' evacuation strategy. The evacuation strategy should also be validated post occupation through the staging of periodic evacuation drills, as well as being included within the buildings' essential safety measures maintenance regime.

5. GENERAL CONSIDERATIONS

Where lifts are proposed for the general evacuation of occupants, theoretically this provides a means of egress for all occupants, including those who may have a disability or mobility impairment. FRV acknowledges that they are not the experts in the design of such systems. However, based on conferences and studies dealing with the use of lifts for evacuation conducted to date and the ABCB's *Lifts Used during Evacuation* Handbook, 2013, a range of deficiencies in current designs have been highlighted. It is the expectation of FRV that designers not only address concerns during desk-top design, but also through robust practical demonstration and ongoing purpose developed maintenance regimes. These concerns relate to the following:

5.1. The number and dimensions of fire-isolated exits should not be reduced as part of a design proposing to incorporate the use of lifts into an emergency management strategy. These exits are encouraged to be used as the primary evacuation route for ambulant occupants.

5.2. The use of lifts for evacuation should only be considered within fully sprinklered buildings with trained wardens and an appropriate emergency management structure is in place.

5.3. A sufficient number of lifts should be provided that facilitate both the evacuation of occupants, as well as firefighter access, with at least one of those lifts dedicated for firefighter use. Upon the general fire alarm, the dedicated firefighter lift is to descend to the ground floor and thereafter should only be operated by fire service personnel via key.

5.4. At the time of the writing of the ABCB's *Lifts Used during Evacuation* Handbook, 2013, there was considerable debate amongst lift manufacturers in regards to changing the lift management software. Such an exercise would not only be costly but would require new communication protocols and extensive retesting to avoid the software's integrity from being compromised. The Australian Elevator Association, one of the authors and stakeholders of the handbook's development, went on to recommend that *"changing the software protocols could only be considered when buy-in from the lift manufacturers is obtained and the software permits the modifications to be carried out with confidence".* It is recommended that if lifts are to be utilised for evacuation, the support and buy-in of both the lift designer and manufacturer are obtained in the first instance. Evidence of this support would then be required by FRV. The number, sequence and design of lifts shall be done in conjunction with the lift/transport engineer and mechanical and fire safety engineers to ensure technical issues, as detailed within the ABCB's *Lifts Used during Evacuation* Handbook, 2013 are considered within the design's reliability, no. of operation (i.e. wind effect, stack effects, smoke/fire separation etc.).

5.5. Lift keys that provide firefighter control are to be kept at the relevant fire stations and at a security/emergency liaison point, fire indicator panel (FIP) or fire control room (FCR).

5.6. It is envisaged that all lifts will be provided with firefighter control, as well as recall facilities. The lifts, once under the control of firefighters, would be operated from within the lift car. Lift annunciation panels should be provided at ground floor adjunct to the lift landing doors and the FIP/FCR.

5.7. Reliable means of communication within the lifts to the FIP/FCR (telephone system, hardwired, fire rated cabling etc.).

5.8. Emergency management plans and evacuation strategies should be developed in consultation with FRV and take into consideration the impact of human behaviour upon the assumed evacuation strategy.

5.9. It is expected that during the development of the evacuation strategy, FRV will be further consulted and advised of the finalised procedures so that operational staff can be advised.

5.10. Appropriate signage and educational programs for all occupants are to be displayed within the lobby areas that provide access to the lifts and stairs, outlining instructions to the building's occupants during an evacuation.

5.11. Procedures and safety systems need to be implemented in the case of a fire that is located in areas such as lifts, lift shafts, lift motor rooms and smoke lobbies, which may preclude the lifts being used for evacuation purposes. In addition, lift controls and programming should not allow lifts to go to smoke/fire affected smoke lobbies.

5.12. Lifts should be designed to incorporate protection from possible equipment overheating and the products of fire.

5.13. Appropriate visual indication should be provided on each floor so that fire wardens and firefighters are provided with the relevant information relating to the status of each lift.

5.14. Consideration should be given to locating lift shafts and fire isolated stairs within a protected smoke/fire lobby, providing a 'safe haven' sufficiently sized to accommodate occupants waiting to be evacuated. The use of lifts for vertical transportation will form only a part of the whole evacuation philosophy.

5.15. The sequence of lifts upon fire alarm shall be developed in consultation with the fire service. A potential lift sequence may, upon alarm, facilitate immediate recall of all lift cares to the safe discharge level (normally ground floor) for the travelling occupants to disembark. Empty lifts would travel to the floor of fire origin (only if a call is registered on the fire floor landing call button) and subsequent lifts to the floors above. Meanwhile, a dedicated firefighter service lift will descend to the ground floor for use by the fire service.

5.16. The lift system, including all mechanisms such as the lift shaft, shall be designed appropriately and incorporated in the buildings' design to minimise the impact of smoke, heat, air pressure, leakage, lift piston effects and human behaviour on lift operation. Integration of lifts with sprinkler and smoke detector activation, and other lift safety systems, shall be an integral component of the system design.

5.17. Specific evacuation systems utilised within the building shall be supported by a reliable power supply. Back-up power supplies are also required to be provided.

5.18. Lift control programming should be developed in consultation with FRV, with consideration given to providing logical sequences under both automatic and manually generated alarms.

5.19. The implementation of an automatic sequential evacuation process is to be considered and the unnecessary evacuation of unaffected floors should be discouraged within the design, unless automatically instigated. Manual control is to also be provided.

5.20. The level of lift safety, reliability and availability, including breakdown, maintenance and associated down time, must be considered in fire and other emergency scenarios.

5.21. Protection against water ingress to lift shafts and drainage for both lobbies and lift shaft pits are essential for continued operation of lifts.

5.22. Management of the lift system in a residential building without the facilitation of wardens is considered to be unreliable and therefore not recommended.

5.23. Regular scheduled training and familiarisation exercises for those who are expected to use the lifts in a fire situation (including occupants, firefighters etc.) must be provided for the life of the building.

5.24. All lift security features must be overridden when the lift car is in fire service mode.

6. DOCUMENTATION

The overall fire safety design must provide an acceptable level of occupant life safety, as well as firefighter life safety.

For the purpose of the fire service review, the following must be provided **in writing** from the practitioner:

- reason for the use of lifts for evacuation
- redundancies proposed in the design
- comment against this guideline and relevant discussion points
- support and endorsement of the design by the lift designer and manufacturer.

It should be noted that a supporting decision made for one building does not automatically infer the same decision will be made for another. Each building shall be reviewed on its own merits, with all justification documented.