

WHITE PAPER

COMPLIANCE PATHWAYS FOR LARGE ISOLATED BUILDINGS UNDER THE NATIONAL CONSTRUCTION CODE

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Abstract

Large industrial, warehousing, and processing facilities are a critical component of Australia's economy. These buildings often contain significant storage volumes, extensive process equipment, and large uninterrupted floor areas that exceed the traditional fire compartment limitations prescribed by the National Construction Code (NCC).

Recognising the operational requirements of these facilities, the NCC provides a specific compliance pathway for large, isolated buildings (LIB). This pathway permits buildings to exceed the maximum fire compartment sizes ordinarily permitted by the deemed to satisfy (DtS) provisions, provided additional measures are implemented to facilitate fire brigade intervention and limit the potential impact of a fire event on surrounding property.

This paper examines the intent of the LIB provisions, outlines the key NCC requirements, and discusses practical considerations for developers, designers, building surveyors, building certifiers, and fire safety practitioners involved in the assessment and certification of large industrial developments.

Introduction

Processing facilities, distribution centres, manufacturing plants, and large-scale warehouses, typically Class 7 and Class 8 buildings, often require substantial floor areas and internal volumes to accommodate operational demands. These demands may include:

- + High-capacity storage systems
- + Automated racking and retrieval equipment
- + Large-scale manufacturing processes
- + Bulk material handling systems
- + Extensive plant and equipment installations

As building size increases, so too does the potential fire load and the complexity of firefighting operations. Larger fire compartments can allow fires to grow unchecked for longer periods, resulting in increased heat release rates, greater structural exposure, and elevated risks to emergency responders.

To address these risks, the NCC generally limits the permissible size of fire compartments through provisions contained within Volume One. Historically, these limitations were prescribed in Table C2.2 of NCC 2019 and are now addressed through the fire compartmentation provisions contained within NCC 2025; now Table C3D3.

Classification	Type A construction	Type B construction	Type C construction
5, 9b or 9c	Max <u>floor area</u> —8 000 m ²	Max <u>floor area</u> —5 500 m ²	Max <u>floor area</u> —3 000 m ²
	Max <u>volume</u> —48 000 m ³	Max <u>volume</u> —33 000 m ³	max <u>volume</u> —18 000 m ³
6, 7, 8 or 9a (except for <u>patient care areas</u>)	Max <u>floor area</u> —5 000 m ²	Max <u>floor area</u> —3 500 m ²	Max <u>floor area</u> —2 000 m ²
	Max <u>volume</u> —30 000 m ³	Max <u>volume</u> —21 000 m ³	Max <u>volume</u> —12 000 m ³

Table C3D3, Maximum size of fire compartments or atria. National Construction Code 2025

The underlying principle remains unchanged: larger buildings require greater levels of fire resistance or additional protective measures to maintain an acceptable level of safety.

Purpose of the LIB Provisions

The Australian Building Codes Board (ABCB) recognises that strict adherence to standard fire compartment size limitations may be impractical for certain industrial and commercial developments.

The LIB provisions offer a compliance pathway that permits fire compartments to exceed conventional limits where the building's isolation from surrounding structures reduces the likelihood of fire spread beyond the site. Rather than relying solely on fire rated construction to limit fire growth, the NCC adopts a broader risk-management approach that considers:

- + Separation from neighbouring property
- + Access for firefighting operations
- + Availability of water supplies
- + Building size and volume
- + Automatic fire suppression systems where required

The provisions seek to balance operational efficiency with community safety and emergency response capability.

Fire Compartment Limitations

Under the NCC, the size of a fire compartment is ordinarily restricted according to the building classification and type of construction. In general terms:

- + Larger fire compartments require higher levels of fire resisting construction
- + More combustible occupancies attract stricter limitations
- + Buildings exceeding prescribed limits must either be separated into smaller fire compartments or utilise an alternative compliance pathway

The NCC permits fire compartments to exceed standard limitations where specific criteria are satisfied. Broadly, these provisions distinguish between:

Buildings not exceeding:

- + 18,000 m² in floor area; and
- + 108,000 m³ in volume.

Buildings exceeding either:

- + 18,000 m² in floor area; or
- + 108,000 m³ in volume.

The applicable compliance requirements vary depending upon the following:

- + Building classification
- + Building size
- + Building volume
- + Fire protection systems installed
- + Availability of perimeter vehicle access
- + Extent of open space surrounding the building

Depending on the circumstances, compliance may be achieved through the provision of the following:

- + Open space surrounding the building
- + Perimeter vehicular access
- + Automatic sprinkler protection, or
- + A combination of these measures
- + Open space requirements

One of the fundamental principles underpinning the LIB provisions is physical separation. By maintaining significant clear space around the building, the risk of fire spread to adjoining property is reduced and

emergency services are provided with improved operational access. The NCC generally requires an open space of 18 metres surrounding the building. This open space must:

- + Be located around the building perimeter
- + Be wholly within the allotment, or
- + Incorporate adjoining roads, rivers, or public places, where permitted by the NCC

Where adjoining roads, rivers or public reserves are used to satisfy the open space requirement, the NCC excludes the furthest 6 metres beyond the opposite boundary of that feature from being counted toward compliance. The open space must also:

- + Include the required perimeter vehicular access
- + Remain substantially clear of obstructions
- + Not be used for material storage or industrial processing
- + Not contain additional buildings, except for limited ancillary structures such as security guard houses or essential service installations

The intent is to maintain a defensible area around the building that can be effectively utilised by fire services during an emergency.

Perimeter Vehicular Access

Fire brigade access is a critical component of the LIB framework. The NCC requires uninterrupted vehicular access around the building to enable firefighting appliances to approach and operate effectively from multiple sides. Typically, the access route must:

- + Provide a continuous width of at least 6 metres
- + Be located within 18 metres of the building
- + Be capable of supporting emergency service vehicles
- + Maintain an unobstructed height suitable for fire brigade operations

These requirements recognise the practical challenges associated with firefighting large industrial buildings and ensure emergency responders can access the site efficiently regardless of fire location.

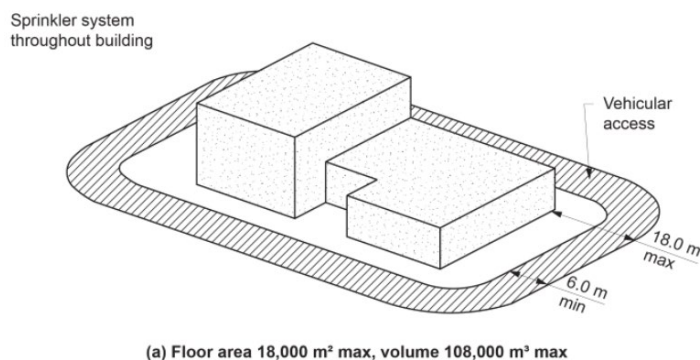


Figure 1 - PVA requirements

Australian Building Codes Board. (2022). National Construction Code 2022 volume one. <https://ncc.abcb.gov.au/editions/ncc-2022/adopted/volume-one>

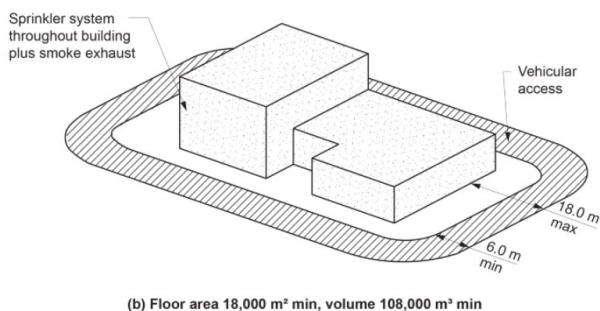


Figure 2 - PVA requirements

Australian Building Codes Board. (2022). National Construction Code 2022 volume one. <https://ncc.abcb.gov.au/editions/ncc-2022/adopted/volume-one>

Multiple Large Buildings on a Single Allotment

The NCC also addresses situations where multiple large buildings are constructed on the same site. Where more than one LIB exists on an allotment, either:

- + Each building must independently satisfy the relevant LIB provisions; or
- + Where buildings are separated by less than 6 metres, they are generally treated as a single building for the purpose of assessment and must collectively satisfy the applicable requirements.

This provision prevents developments from circumventing fire compartment limitations by artificially separating interconnected buildings with minimal clearances. The approach reflects the reality that buildings located in close proximity may present a similar fire risk profile to a single larger structure.

Role of Automatic Fire Suppression Systems

For larger developments, automatic sprinkler protection may form part of the compliance pathway. The NCC recognises that sprinklers can:

- + Detect and control fires at an early stage
- + Reduce heat release rates

- + Improve occupant safety
- + Assist firefighting operations
- + Minimise property damage

The requirement for sprinkler protection depends upon the building's classification, floor area, volume, and the specific LIB provisions being relied upon. Where sprinkler systems are incorporated, they must be designed and installed in accordance with the relevant Australian Standards referenced by the NCC.

Design Considerations for Practitioners

When assessing whether a development can utilise the LIB provisions, project teams should consider the requirements early in the design process. Key considerations include:

Site selection

The availability of sufficient perimeter open space may significantly influence site suitability.

Master planning

Building location, access roads, and future expansion areas should be coordinated to preserve compliance.

Fire brigade consultation

Early engagement with the relevant fire authority can assist in identifying operational requirements and potential constraints.

Building classification

The applicable NCC requirements vary depending upon the building's classification and intended use.

Performance solutions

Where strict compliance with the DTS provisions is impractical, a performance solution may be developed in accordance with the NCC performance requirements.

Building surveyor considerations

Building surveyors play a critical role in assessing LIB proposals. Assessment typically includes verification of the following:

- + Building classification
- + Fire compartment dimensions
- + Open space compliance
- + Vehicular access arrangements
- + Fire protection systems

- + Site layout
- + Interaction with neighbouring buildings

Particular attention should be given to future site development. Changes to site conditions after occupation, such as the introduction of storage areas, temporary structures, or additional buildings within required open space zones, may compromise ongoing compliance. Accordingly, building owners should understand that LIB concessions often rely on maintaining site conditions throughout the building's life.

Summary

LIBs represent a practical and effective compliance pathway within the NCC for industrial and commercial developments requiring extensive floor areas and volumes. The provisions recognise that fire safety outcomes can be achieved through a combination of building separation, emergency vehicle access, fire protection systems, and site planning, rather than relying solely upon traditional fire compartmentation limits.

For developers, designers, and building surveyors, a thorough understanding of these requirements is essential. Early consideration of open space, perimeter access, and fire protection measures can avoid costly redesigns and facilitate a smoother approval process.

As industrial developments continue to grow in scale and complexity, the LIB provisions will remain an important mechanism for balancing operational efficiency with the NCC's fundamental objective of protecting life, property, and the broader community from the effects of fire.

Call-to-Action

Early assessment can help identify compliance risks before they affect design, approvals, or construction.

Our specialists provide advice on NCC requirements, performance solutions, fire engineering, and building certification considerations for large industrial and warehousing developments.

Speak with our team to discuss your project.

Expert: <https://www.jensenhughes.com/pacific/experts/ben-prentner>