

Purpose

This guideline has been developed to help improve consistency with the installation, education and enforcement of a racking systems installed in buildings.



Code Reference

Current National Building Code – Alberta Edition Division B

Current National Fire Code - Alberta Edition Division B

NFPA 13-2019 Installation of Sprinkler Systems

NFPA 14-2013 Installation of Standpipe and Hose Systems

Alberta Municipal Affairs STANDATA 19-BCV-008 “Multi-Level Storage Racking Systems”

Rocky View County Guideline “Fire Alarm & Fire Suppression Systems”



Summary

The requirements within this guideline are applicable to the installation of racking systems within a building or tenant space. The addition of racking is considered an alteration to a building; therefore a building permit is required when the top of the storage located on a rack exceeds 3.6 m (12 ft.) above the floor or when a racking system provides an intermediate work platform.



Interpretation

This guideline provides clarity and direction from Rocky View County on their interpretation surrounding racking systems and the requirements for Building Permit applications. Based on the information provided within this guideline, racking systems shall be installed based on the following criteria:

1. **Definitions** – The definitions below are from the NFPA 13-2019, NFPA 14-2013, and NFC 2023 AE.
 - a) Clearance to Ceiling – The distance from the top of storage to the ceiling above (NFPA13)
 - b) High-Piled Storage – Solid-piled, palletized, rack storage, bin box, and shelf storage in excess of 12 ft. (3.7 m) in height. (NFPA13)
 - c) Hose Connection – A combination of equipment provided for connection of a hose to the standpipe system that includes a hose valve with a threaded outlet. (NFPA14)
 - d) Hose Station – A combination of a hose rack, hose nozzle, hose, and hose connection. (NFPA14)
 - e) Hose Valve – The valve to an individual hose connection. (NFPA14)

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- f) Individual Storage Area - Means the area occupied by piles, bin boxes, racks or shelves, including subsidiary aisles providing access to the stored products, and separated from adjacent storage by aisles not less than 2.4m in width. (NFCAE)
- g) Rack – Means any combination of vertical, horizontal or diagonal members that support stored materials on solid or open shelves, including both fixed and portable units. (NFCAE)
- h) Shelf Storage – Storage on structures up to an including 30 in. (0.76 m) deep separated by aisles at least 30 in. (0.76 m) wide. (NFPA13)
- i) Back-to-Back Shelf Storage – Two solid or perforated shelves up to 30 in. (0.76 m) in depth each, not exceeding a total depth of 60 in. (1.52 m), separated by a longitudinal vertical barrier such as plywood, particleboard, sheet metal, or equivalent, with a maximum 0.25 in. (6.4 mm) diameter penetrations and no longitudinal flue space and a maximum storage height of 15 ft. (4.57 m). (NFPA13)

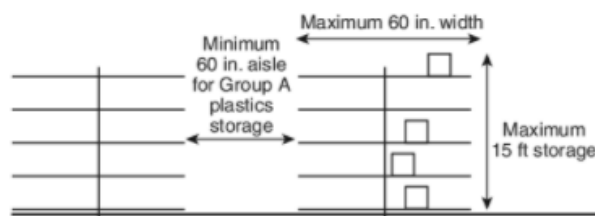


FIGURE A.3.9.2.6.1 Back-to-Back Shelf Storage.

- j) Standpipe – The system piping that delivers the water supply for hose connections, and for sprinklers on combined systems, vertically from floor to floor. (NFPA14)
2. Shelf versus Rack – If a vertical storage unit does not conform to the definition of Shelf Storage or Back-to-Back Shelf Storage, then it will be considered a Rack, and a building permit will be required if the top of the storage located on a rack exceeds 3.6 m (12 ft.) above the floor.
 3. Sprinkler System - Existing buildings that are unsprinklered may be required to be sprinklered depending on what is stored on the racks, the height of racks, area of storage, or aisle widths. A Professional Engineer is required to confirm that the type of storage in the building or tenant space does not exceed the size limits as per Table 3.2.3.2. below. Refer to Section 3.2 of the current NFCAE for further requirements.

Table 3.2.3.2.
Size Limits for Individual Storage Areas
 Forming Part of Sentences 3.2.3.2.(1) and (2) and Clause 3.2.7.5.(1)(c)

| Product Classification | Buildings that are not Sprinklered | | Sprinklered Buildings | |
|---|------------------------------------|----------------------|-----------------------|----------------------|
| | Area, m ² | Height of Storage, m | Area, m ² | Height of Storage, m |
| Class I commodities | 500 | 6.5 | 1 500 | 9.0 |
| Class II commodities | 500 | 6.5 | 1 500 | 9.0 |
| Class III commodities, Group C plastics | 250 | 4.5 | 1 000 | 9.0 |
| Closed containers of distilled beverage alcohol | 250 | 4.5 | 1 000 | 9.0 |
| Class IV commodities, Group B plastics | 250 | 3.6 | 1 000 | 9.0 |
| Group A plastics | 250 | 1.5 | 500 | 6.1 |

4. Clearances to Ceiling In Unsprinklered Buildings

- a) A clearance of not less than 1 m between the top of storage and the underside of the floor or roof deck shall be maintained. (NFCAE)

If the top of storage in piles, on shelves, in bin boxes or on racks is above the lower chords of floor or roof structural framing members, a clear space of not less than 300 mm shall be maintained between the storage and the structural members. (NFCAE)

5. Permit Application Requirements

- a) Structural Plans - Plans must be drawn to scale and indicate the following information:

- Professional Engineer's stamp
- Schedules A & B if required by Division C Article 2.4.2.1. of the current National Building Code - Alberta Edition or Professional Engineer's letter
- Design loading of the racking system
- Rack dimensions
- Location and size of all structural members
- Height of storage including clearances to the underside of roof deck or ceiling
- Anchorage details to the floor slab
- Slab analysis letter from a Professional Engineer

- b) Floor Plan(s) - Plans must be drawn to scale and indicate the following information:

- Professional Engineer's and/or Architect stamp if required by Division C Article 2.4.2.1. of the current National Building Code - Alberta Edition
- Schedules A & B
- Unsprinklered buildings require a commodities letter from a Professional Engineer to confirm size limits as per Table 3.2.3.2. of the current National Fire Code Alberta Edition
- Type of materials stored on the racks
- Width of all main and secondary aisles
- Travel distance measurements to the exits
- Emergency lighting locations
- Exit signage locations
- Footprint of the racking storage area

- c) Sprinkler Letter – A Professional Engineer's stamped letter is required to confirm that the existing sprinkler system is adequate for the additional racking system. Sprinkler plans are required if a sprinkler system has been added to or altered, due to the addition of the racking system. Refer to the Fire Alarm & Fire Suppression Systems guideline for further requirements. Plans must be drawn to scale and indicate the following information:

- Professional Engineer's stamp as required by Division C Article 2.4.2.3. of the current National Building Code - Alberta Edition
- Schedules A & B
- Type of commodities stored on the rack including hazard classification
- Sprinkler system type

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- d) Fire Alarm Plans - Plans are required if the fire alarm system has been added to or altered, due to the addition of the racking system. Refer to the Fire Alarm & Fire Suppression Systems guideline for further requirements. Plans must be drawn to scale and indicate the following information:
- Professional Engineer's stamp as required by Division C Article 2.4.2.1. of the current National Building Code - Alberta Edition
 - Schedules A & B
 - Visual and audible signals
- e) Verification Letters - After the racking system is installed, the following verification information must be submitted to Building Services prior to the Final Inspection taking place:
- Schedules C from all registered Professionals if applicable
 - Sprinkler system verification stamped and signed by a Professional Engineer
 - Fire alarm verification stamped and signed by a Professional Engineer

**Additional Information**

- A Fire Safety Plan shall be prepared and submitted to Fire Services as specified in Article 3.2.2.5. of the current NFCAE.
- Fees are established based on the footprint of the racking storage area, see our Construction Value Calculator for Commercial/Industrial and Institutional Buildings on our website.
- For information on Multi-Level Racking Systems, refer to the Alberta Municipal Affairs – Building STANDATA website.



Illustrations



Reference

Approval Date

- October 2024

Last Review Date

- October 2024