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NORTH VANCOUVER
DISTRICT

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GUIDELINE

HIGH RACK STORAGE

This Guideline is intended to provide you with basic information related to the need for a building permit for seismic restraint, and the parameters for maximum racking height and size of storage area for unsprinklered and sprinklered buildings. This Guideline also provides direction for the need for adequate sprinkler protection, as well as access aisles and posted information. This Guideline is not intended to replace the need for a registered professional. Use this Guideline as a tool in conjunction with Fire Department and Building Department staff advice, as well, a registered professional if necessary.

1. Do you need a permit?

The District of North Vancouver requires a permit if racking is 8'6" or greater in height as measured to the top shelf. For racking permits the Building Department requires:

- 5 sets of fully dimensioned floor plans showing the racking layout.
- 3 sets of signed and sealed racking drawings.
- 3 sets of signed and sealed sprinkler drawings (if building is sprinklered).

The Plans should include:

- Cross section showing the height of the racking and the clearances to ceiling fixtures such as sprinkler heads.
- Travel distances to exits, aisle widths, location of emergency lighting, exit signage, emergency lighting, and fire alarm devices including manual pull stations.
- Maximum height of racking and size of storage area as per the BC Fire Code Table 3.2.3.2., based on the commodity class of the product being stored.
- If building is sprinklered, the limitations of the design criteria of sprinkler system.
- Signage and posted information as per the BC Fire Code 3.2.2.5.

Note: Vertical storage under 8'6" is considered shelving and does not require a building permit. However, seismic restraint is recommended for all shelves. Back to back shelving units with a depth greater than 30" are considered racking.

2. What commodity (product) are you storing?

Maximum racking height and size of storage area is determined in the BC Fire Code Table 3.2.3.2 for unsprinklered and sprinklered buildings. If your proposed racking does not comply

with the maximum height and area of storage as noted in the following table, you could redesign to comply, or you may consult with a registered professional to determine if you could consider an engineered Alternate Solution.

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	Unsprinklered *Buildings*		*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

1.5 m = 4.9 ft 3.6 m = 11.8 ft 4.5 m = 14.7 ft 6.1 m = 21 ft
6.5 m = 21.3 ft 9.0 m = 29.5 ft

- Class I - non-combustible commodities stored on either wood pallets, single layer corrugated cartons (with or without pallets, or shrink wrapped or paper wrapped as a unit (with or without pallets).
- Class II – non-combustible commodities in slatted wooden crates, solid wood boxes, multiple layered corrugated cartons (with or without pallets).
- Class III – commodities fashioned from wood, paper, natural fiber, cloth, or Group C plastics, with or without cartons, boxes or crates, and with or without pallets. Shall be permitted to include 5% Group A or B plastics.
- Class IV – commodities with or without pallets that meet one of the following:
    - Constructed partially or totally of Group B plastics.
    - Consists of free flowing Group A plastic material.
    - Contains 5-15% by weight or 5-25% by volume of Group A plastics.

  The remaining product shall be wood, paper, natural synthetic fibre, or Group B or C plastics.
- Group A plastics most restrictive class, includes, but not limited to: ABS, acrylic, butyl rubber, fiberglass reinforced polyester, natural rubber (if expanded), nitrile rubber, polycarbonate, polyester elastomer, polyethylene, polypropylene, polystyrene, polyurethane, highly plasticized PVC, and SBR.
- Group B plastics include, but are not limited to, cellulosics, fluoroplastics, natural rubber (not expanded), nylon, and silicone rubber.
- Group C plastics include, but are not limited to, fluoroplastics, melamine, phenolic resins, rigid PVC, and urea formaldehyde.

Note: For a detailed list of commodity classes and examples refer to NFPA13 Section 5.6.

3. Do you need a sprinkler system, and/or is your sprinkler system sufficient for the type of use?

Your storage needs for the type of commodity, racking height and/or size of storage area may require a sprinkler system, and/or confirmation that your sprinkler system is sufficiently designed. Sprinkler systems are designed to meet different classifications for occupancies and occupancy use. An existing sprinkler system may not have been designed for the type of use that you are proposing.

Sprinkler systems for rack storage must be designed to meet NFPA13 “Installation of Sprinkler Systems”. Sprinkler systems can be designed as: light, ordinary hazard group I, ordinary hazard group II, extra hazard group I, or extra hazard group II. In addition, they could have special design features based on the type of commodity being stored, the height of the storage, the configuration of the product, and the design of the racking. Additional features may be incorporated such as special sprinkler head design, in-rack sprinklers, or an increased water supply. If you don’t have a record of the design criteria for your sprinkler system, a registered professional may be required to review the sprinkler system to ensure that it is designed to meet your storage and racking needs.

4. What additional life safety features are required?

As noted in Section 1 there is additional information that should be included on your plan submission for a racking permit. Be sure to include access aisle widths and lengths, clearances to walls/ceilings/sprinkler heads (if applicable), signage and posted information details, as well as the locations of the life safety systems that are present or proposed in your space/building.

Access Aisles (BC Fire Code 3.2.2.2):

- 1m wide to access panels/fire protection equipment
- If room is greater than 100m2+/1076ft2 must have a main access aisle which must be:
    - 2.4m wide if storage under 6m high
    - 3.6m wide if storage over 6m
    - 2.4m wide if sprinklered
    - Entire length of storage area if only 1 main aisle
    - Can be entire length or width if 2 or more main aisles are provided
    - Must be two FD access points from outside to access the main aisle
- May have a dead-end aisle if minimum 900mm (36” wide) and:
    - F1 Occupancy – Max 7.5 meter (25 feet) long
    - F2 Occupancy – Max 10 meter (33 feet) long
    - F3 Occupancy – Max 15 meter (50 feet) long

Clearances (BC Fire Code 3.2.2.3):

- Wall Clearance 600mm if products swell/expand with water
- Unsprinklered (top of Storage 1m+ Ceiling)
- Sprinklered (18” clearance to sprinkler heads)

Posted Information (BC Fire Code 3.2.2.5):

- A Fire Safety Plan/Floor Placard is required in conformance with Section 2.8 and Sentences 3.2.2.5.2, 3.2.2.5.3. and 3.2.2.5.5. The Plan/placard shall identify:
    - Product classification
    - Method of storage including aisle widths
    - Maximum permitted height of storage
    - Maximum permitted size of individual storage areas
    - If sprinklered, the sprinkler system design criteria, inside and outside hose allowances, and results of the benchmark sprinkler system main drain and water flow tests.
    - Group A plastics, rubber products, Level 2 or 3 aerosols, or dangerous goods locations and maximum quantity of product being stored.
- Posted information:
    - Storage method and maximum height of storage shall be posted in storage area.
    - Signage is to be a minimum of 200mm in dimension, and letter must not be less than 25 mm high.

Contact Information:

Fire Department, Fire Prevention Office – 604-980-7575 or firecom@dnv.org
Building Department – 604-990-2480