BULLETIN 2024-001-AD/BU **May 14, 2024**

Storage Racks & Shelves in Buildings

This bulletin describes administrative requirements pertaining to storage racks and shelves installed in buildings.

Background

The Building By-law and other supplementary material[1], establishes basic structural requirements for storage racks installed in buildings, and identifies the significant risk to life safety that could exists where such systems are not properly designed, installed, and maintained. While the By-law requirements focuses on free-standing racks for bulk product storage, it is clear that similar risks exist for racking and shelving, or other similar substantive structures used for storage, in publicly occupied non-industrial settings.

Submission Requirements

As an administrative direction, owners and builders carrying out tenant works that include the installation of multiple rows of storage rack, shelving, or similar storage systems over 6'-0" in height in industrial or mercantile occupancy, are requested to provide a letter from a qualified individual confirming that the racks or shelves have been secured and restrained to resist movement or overturning prior to occupancy.

Explanation

Because of the high centre of gravity and mass of tall storage systems, this can represent a significant life safety hazard to building occupants, particularly where an individual climb on the storage system to reach stored goods. Currently, several regulations or standards exist that address this concern, but these standards only address this risk in the context of free-standing steel rack systems in an industrial setting.

In order to more fully address this concern, the Chief Building Official is requiring additional documentation be provided prior to the occupancy of a building containing multiple rows of storage system over 6'-0" in order to verify that these storage systems have been secured and restrained appropriately, where there is an increased degree of risk due to the storage systems height, mass, or impact on the public.

The referenced 6'-0" height has been established as a reasonable limit based on anthropomorphic data associated with typical forward high reach capabilities for ambulatory persons[2].At height higher than this, there is an increased likelihood that an individual may choose to climb the storage arrangement in order to reach objects above their normal reach, which could lead to harm or injury if the storage racks or shelves are not restrained.

Supplementary Information

Additional information can be found in various design standards such as A344 "User Guide for Steel Storage Racks," ANSI MH16.1, "Design, Testing and Utilization of Industrial Steel Storage Racks,"and FEMA 460, "Seismic Considerations for Steel Storage Racks Located in Areas Accessible to the Public," While these standards do not generally address shelving and display fixtures used for retail purpose, these are sufficient

[1] Structural Commentaries: User's Guide – NBC 2015: Part 4 of Division B, Commentary J, no.243-245

[2] As published in the BC Building Access Handbook, the maximal high forward reach for adult males is 1928 mm, and adult females is 1786 mm.

City Hall 453 West 12th Avenue Vancouver BC V5Y 1V4 | website: vancouver.ca/CBO
Office of the Chief Building Official | tel: 604.873.7611 | fax: 604.873.7100 | email: cbo@vancouver.ca

to identify specific concerns that designers installation such equipment should consider as part of their designs.

WorkSafeBC Regulations

Further to the above, WorkSafeBC Occupational Health and Safety (OHS) Regulations include specific requirements for that apply to steel storage racks made of steel frames, beams, and associated accessories that are assembled into a structure to support materials and products. These requirements are focused on WorkSafeBC's mandate for worker safety, and therefore only require regulatory enforcement for storage arrangements of 8'-0" or more, and do not cover racking or shelving used for retail use. The application of these requirements are therefore wholly separate from the scope of the Building By-law and it objectives to establishes minimum requirements for the protection of all occupants in or around a building.

EGBC Practice Advisory

Engineers and Geoscientists of BC have also published a practice advisory titled "New Regulations for Steel Storage Racks," reminding registered professionals governed by the Professional Governance Act of their obligations with respect to good practice. While this guide focuses on the seismic restraint of steel storage rack, it seems appropriate that the concepts of good engineering practice should continue to apply to all work carried out by registered professionals and the information in the guide could be considered broadly applicable for similar construction where no directly applicable standard is available.

(Original signed by)

Saul Schwebs, Architect AIBC
Chief Building Official
Director, Building Code and Policy

(Original signed by)

Kevin Lau, P.Eng., CP
Manager, Building Policy Branch

Appendix A:

<Add appendices here if required. Create addition sections if needed, or delete if no appendices>