MINNEAPOLIS FIRE DEPARTMENT
FIRE PREVENTION BUREAU POLICY # 23-1
HIGH PILED STORAGE

ISSUE:

The fire code requires increased levels of protection in buildings or areas that have high piled storage. Some details of that protection are not addressed in the code.

CODE REQUIREMENTS:

Chapter #23 of the MSFC addresses the general requirements for high piled storage.

PROBLEM:

Types of commodities stored and methods of storage may change over time. The fire protection features of the building need to be adequate for the fire hazard that exists.

ACCEPTABLE MEANS of COMPLIANCE:

A. High Piled Storage Area Defined:

High piled storage area is the actual floor area covered by the *rack structures*, flue spaces and aisles between the racks, plus a 48" aisle around the outside of the rack structures.

OR

The area that is used for *pallet or solid piled* high piled storage, internal aisles plus a 48" aisle around the outside of the storage area.

B. Marking of High Piled Storage Areas:

When the entire building is not designed for high piled storage, or portions of the fire safety systems are designed for differing storage configurations or the design storage height is less than the available height, the areas and heights are to be permanently marked as outlined on sheet #3.

C. Existing Buildings:

1. **The sprinkler system must be of adequate design for the hazard presented by the storage and use of the building. A permanent sign is to be attached to the system riser or on the wall next to the riser listing the details of the sprinkler system design and details of the storage (see sheets # 4 & 5 of this policy for the acceptable sign formats).**
2. **When sprinkler systems are found in buildings with high piled storage that do not have the system design/storage information sign, orders are to be written requiring an analysis by a fire protection engineer or a licensed fire protection contractor. The analysis is to be submitted to the FPB for review and the information signs are to be posted as stated in item #C 1 above.**

C. (Cont.)

3. When there are changes to the storage configuration, storage methods, commodity class or the size of the high piled storage area that materially increase the fire hazard, the high piled storage area is to be brought into compliance with the sprinkler and heat/smoke control requirements of the latest edition of the MSFC.

D. New Buildings, Additions or Change of Occupancy:

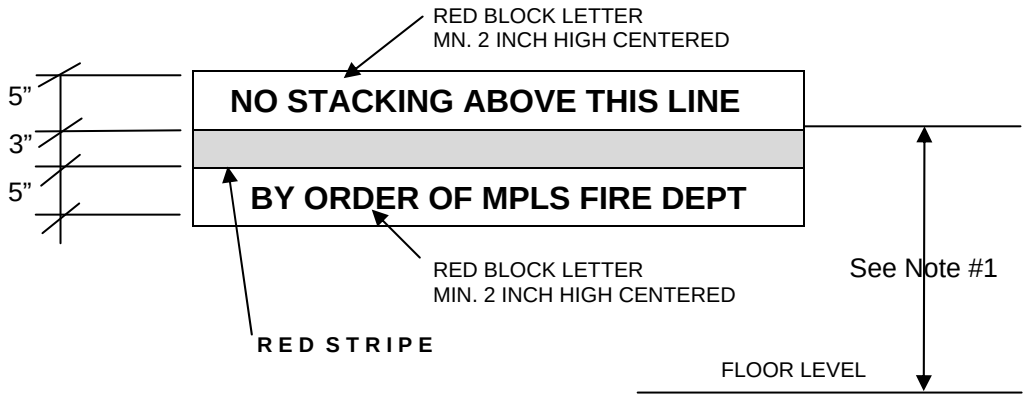
1. **Fire vehicle access roads: When required by the MSFC the access roads are to meet the requirements of MFD policy #5-3.**
2. **On site water supply: When required by the MSFC or by MFD, the water supply will be provided by fire hydrants that meet the requirements of MFD policy #5-2.**
   Wall hydrants may be used *only* when approved by the FPB.
3. **Firefighter access doors: Required access doors are to be swing type with hardware and keyed locks on the exterior of the doors. Where doors are located above grade, permanent stairs are to be provided. The interior of the doors are to marked "Keep Clear of Storage". Rollup doors are *not acceptable* as firefighter access.**
4. **Sprinkler system design: The system is to be designed to protect the highest expected hazard (based on commodity type, storage height, storage method, pallet material, etc.). A permanently affixed sign containing the information found on page #3 is to be mounted on or at the system riser.**
5. **Smoke/heat venting: Venting may be either gravity or mechanical. Mechanical venting is to be manually activated only, automatic operation is not acceptable. Refer to MFD policy #9-9 for details.**
6. **Interior hose valves: Hose valves for firefighter use are generally not required. MFD may determine that hose valves are needed when unusual conditions are present.**
7. **Fire extinguishers: Hand held extinguishers are to be provided and mounted as required by the MSFC. The location of each extinguisher is to be marked with signage mounted 8 feet above the extinguisher.**
8. **Identification of exits: Exit signs are to be visible from cross or secondary aisles. Where it is not feasible to mount signs within the storage area, marking and stripping of the floor may be approved as an alternate method.**

IDENTIFICATION of DESIGNATED STORAGE AREAS and ALLOWABLE STORAGE HEIGHTS

Storage heights and the size and location of storage areas determines the design of fire safety systems, in turn the safety systems then limit the height and areas that may be used for storage.

Marking of maximum storage height:

The allowable storage height is to be identified by approved signs. The signs are to be mounted on walls and columns within the storage area. Each column is to have at least one sign and walls are to be marked at 20 foot intervals.



Note #1: The mounting height is to be the allowable storage height based on the design of the fire safety systems.

Marking of designated high-piled storage areas:

When the entire building or room is not designed for high-piled storage or where acceptable storage heights vary within the warehouse, the storage areas are to be permanently marked on the floor.

The boundaries are to be identified by a 3 inch wide red stripe. Signage is to be painted on the high-piled storage side at 20 foot intervals stating "high-piled storage", lettering to be 2 inch high green letters. Signage is to be painted on the other side of the boarder at 20 foot intervals stating "no high-piled storage" or "allowable storage height ___ ", lettering is to be 2 inch high red letters.

Minneapolis Fire Department Fire Prevention Bureau
350 south 5th Street – Room 230 Office 612.673.2546
Minneapolis, MN. 55415 – 1387 Fax 612.673.2828

APPROVED STORAGE PARAMETERS for the WAREHOUSE at

(Address) _____

Area used for high-piled storage _____sq. ft.

Storage method:

Applicable N/A

☐ ☐ Rack:
☐ Single row ☐ Double row ☐ Multi row ☐ Solid shelf ☐ Binbox
Aisle width _____
Flue spaces: Transverse _____ Longitudinal _____
Max. storage height _____
Roof height _____

☐ ☐ Pallet or Solid Piled:
Max. pile size _____ sq. ft.
Aisle width _____
Max. storage height _____
Roof height _____

☐ ☐ Pallets: ☐ Wood ☐ Plastic, listed ☐ Plastic, not listed ☐ Metal

Commodity class: ☐ Class 1 ☐ Class 2 ☐ Class 3 ☐ Class 4
☐ High hazard
☐ Plastics:
☐ Group A ☐ Group B ☐ Group C

☐ ☐ Encapsulated packaging

Note: Changes to storage methods or commodities requires a re-evaluation of the fire safety systems.

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SPRINKLER SYSTEM DESIGN for WAREHOUSE at

(Address) _____

System Type: ☐ Wet ☐ Dry ☐ Preaction ☐ Other _____

Density _____ gpm/sq. ft. over an area of _____ sq. ft.
Max. coverage per sprinkler _____ sq. ft.
Sprinkler type _____, Orifice K factor _____

Sprinkler design is based on _____ edition of NFPA Std. #13.
Table(s) _____
Design curve(s) _____

Provided N/A

☐ ☐ In-rack sprinklers, Type _____ K factor _____
Sprinkler spacing _____ ft. Min. pressure _____ psi
Locations in racks _____

☐ ☐ 1 1/2 " hose valves

☐ ☐ Column protection

Water Supply Requirements:
Overhead system demand _____ gpm @ _____ psi at base of riser
In-rack system demand _____ gpm @ _____ psi
Inside hose demand _____ gpm
Outside hose demand _____ gpm

Total demand _____ gpm @ _____psi at base of riser

System installed by: (Fire protection contractor) _____
(phone) _____

Note: Changes to storage methods or commodity type requires a re-evaluation of the fire safety systems.