

**NORTH COUNTY FIRE PROTECTION DISTRICT**  
**Policy and Procedure Manual**

FIRE PREVENTION  
PLANS AND PERMITS

SECTION 340.14  
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**High Piled Combustible Storage**

**PURPOSE:** The intent of this guideline is to provide the requirements for the protection of high-piled combustible storage of a variety of commodities. The following requirements will ensure that appropriate measures have been taken to ensure safety to the public and will ensure that the required protection of these commodities has been designed for the appropriate level of hazard as required by the California Fire Code (CFC), Article 81.

**POLICY:** High-piled combustible storage plans and installations shall be inspected and installed in accordance with the appropriate NFPA requirements. Said requirements shall be referenced when reviewing such systems..

**DEFINITIONS:**

High-Piled Combustible Storage: The storage of combustible materials in combustible packaging in closely packed piles, on pallets, in racks or on shelves where the top of storage is greater than 12 feet in height. High-piled combustible storage also includes certain high-hazard commodities, such as rubber tires, Group A plastics, flammable liquids, idle pallets and similar commodities, where the top of storage is greater than 6 feet in height.

High-Piled Storage Area: An area within a building which is designated, intended, proposed or actually used for high-piled combustible storage. The area shall be separated from other areas by a permanent partition or 15'.

Rack Storage: A combination of vertical, horizontal and diagonal members that support stored materials. Racks can be fixed or portable.

Shelf Storage: Storage on shelves less than 30 inches deep with the distance between shelves not exceeding 3 feet vertically. For larger shelves and other storage arrangements see rack storage.

Solid Shelving: Shelving that is solid, slatted or of other construction located in racks and which obstructs sprinkler discharge into the rack.

**PROCEDURE:**

- I. PLAN REVIEW AND SUBMITTAL (CFC 8101.3): At the time of permit application, plans and specifications, including and not limited to the information listed below, shall be submitted for review and approval. For certain HPS reviews, the services of a design professional familiar with the requirements contained in CFC Article 81, may be of great assistance.

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- A. A minimum of three sets of plans shall be submitted with the following information, per CFC §8101.3.2.
- B. A letter of intent containing a detailed description of the products to be stored and the description of all containers, pallets and packaging materials. This letter must also include a detailed description of the storage method(s) (racks, shelves, pallets), the total storage area in square feet, maximum storage height(s) and aisle widths. An authorized officer of the company or business must sign this letter.
- C. A scaled site plan which shows the entire building, including all fire access lanes, fire hydrants and fire sprinkler riser(s).
- D. The occupancy group as required by CBC Chapter 3.
- E. A scaled floor plan of the building showing locations and dimensions of the high-piled storage area, location of the racks and access doors to the storage area.
  - 1. The maximum desired storage height for each designated storage area, per array.
  - 2. The number of tiers within each rack.
  - 3. The commodity clearance between the top of storage and the sprinkler deflector for each storage arrangement.
  - 4. Aisle dimensions between each storage array.
  - 5. Maximum pile volume for each storage array.
  - 6. Location and classification of different commodity classes.
  - 7. Location of commodities which are banded or encapsulated.
- F. Dimension and location of the transverse and longitudinal flue spaces.
- G. The location, model, type and automatic link temperature of the automatic/ manual release smoke vents.
- H. The design (construction), location and depth of the curtain board assembly.

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- J. Code Specific Requirements: In addition to the aforementioned, each of the following will be researched to determine applicability based upon the specified installation:
1. General Fire and Life Safety Provisions: (CFC 8102): Fire-protection and life safety features for high-piled storage areas shall be in accordance with CFC Article 81 and other nationally recognized standards. Fire detection systems, smoke and heat removal, curtain boards, small hose valves and stations, and fire sprinkler design densities shall extend to the lesser of 15 feet beyond the high-piled storage area or to a permanent partition. The aggregate of all high-piled storage areas within a building shall be used to design the fire protection features found in CFC Table 81-A (attached), unless such areas are separated from each other by a 1-hour rated fire resistive wall constructed in accordance with the CBC. Distinct occupancy groups shall be separated according to CUBC Section 302.
  2. California Fire Code Permit (CFC 8101.3): Plans and specifications shall be submitted to the NCFPD Fire Prevention Bureau. A CFC permit is required when a building or portion thereof is used for high-piled storage exceeding 500 square feet I area. All permits will be issued following plan approval and completion of corresponding inspections of the HPS installation. CFC permit fees are invoiced annually. The OCFA Board of Directors adopts permit fees.
  3. Commodity Classification (CFC 8101.4): Commodities shall be classified as Class I, Class II, Class III, Class IV or High Hazard, in accordance with CFC Article 81.
    - a. Plastics shall be classified as Group A, B or C in accordance with CFC Article 81. To determine the proper commodity classification of products with limited quantities of Group A plastics in mixed commodities, use CFC Figure 8101.4-A. This figure identified the quantity of Group A plastics allowed to be stored in a package, carton or on a pallet without increasing the hazard and commodity classification.
    - b. The designation and protection features of a high-piled combustible storage area of portion thereof intended for storage of different commodity classes shall be based on the highest hazard commodity stored, except as otherwise provided in CFC Section 8101.5.2; Designation based upon engineering analysis.
  4. Sprinkler Systems: When fire sprinklers are required by CFC Table 81-A

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(attached), or by the California Building Code, or if otherwise provided, the sprinkler system shall be installed in accordance with the currently adopted code and standards that regulate high-piled storage. Provide a [fire sprinkler design package](#) that includes scale drawings and hydraulic calculations designed to protect the specified hazard class of the stored commodity. Include the sprinkler head temperature, orifice size and the design density of the existing fire sprinkler system.

5. [Fire Detection Systems](#): (CFC 8102.5): When fire detection is required by CFC Table 81-A (attached), an approved automatic fire detection system shall be installed in accordance with the currently adopted NFPA 72 standard throughout the high-piled storage area. This system shall be installed and monitored as required by CFC Section 1007.
6. [Fire Dept. Access](#): (CFC 8101.6): When building access is required by CFC Table 81-A, access roadways shall be provided to within 150 feet of all portions of the exterior walls of the building used for high-piled storage. When access doors are required by CFC Table 81-A, they shall be provided in each 100 lineal feet of exterior wall and shall face the required access roadway.
7. [Smoke and Heat Removal](#): (CFC 8102.7): When smoke and heat removal are required by CFC Table 81-A, smoke and heat vents shall be of an approved type and shall operate automatically by a heat response device rated between 1 002F and 200-F above ambient temperatures and contain a manual release roof handle. Vent size shall be in accordance with CFC Table 81-B (attached). The fusible link temperature is required to be greater than that of the fire sprinkler head at the roof, to prevent early venting.
8. [Curtain Boards and Small Hose](#): (CFC 8102.8 AND 8102.9): When required by CFC Table 81-A, curtain boards and small hose stations shall be installed in accordance with CFC Section 8102.8 and 8102.9.
9. [Rack Flue Spaces](#) (CFC 8101.6): Requirements for flue spaces within the rack storage are provided in CFC Table 8104.3-A, (attached).
10. [Control of Ignition Sources](#): Smoking shall be prohibited in the warehouse storage area. "NO SMOKING" signs shall be conspicuously posted. Clearance between ignition sources and the combustible storage shall be maintained in accordance with CFC Section 1109.
11. [Solid Piled and Shelf Storage](#) (CFC 8103): Shelf storage, storage in solid piles, solid piles on pallets and binbox storage in binboxes not exceeding 5 feet in any

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dimension shall be in accordance with CFC Sections 8102 and 8103.

12. Rack Storage (CFC 8104): Rack storage shall be in accordance with CFC Section 8102 and 8104. Racks with solid shelving having an area greater than 32 square feet measured between approved flue spaces at all four edges of the shelf shall be in accordance with CFC Section 8104.2.3.
13. Automated Storage (CFC 8105): Automated storage similar to carousel storage shall be in accordance with CFC Section 8105.
14. Specialty Storage (CFC 8106): Record storage facilities used for rack or shelf storage of combustible paper records greater than 12 feet in height shall be in accordance with CFC Section 8102, 8104 and CFC Standard 81-4. Palletized storage of records shall be in accordance with CFC Section 8103.1.
15. Technical Assistance: Due to the complex building design of the requirements specified within the CFC and adopted standards, it is often necessary to obtain the service of a fire protection design professional to assist with developing a protection scheme that meets the requirements of both the business and the California Fire Code.