High Piled Storage Requirements

What is considered to be High-Piled Storage (HPS)?
HPS is the storage of combustible material, either on racks or piles, where the top of the storage is greater than 12 feet in height or for certain highly flammable materials, storage greater than 6 feet. When the area of the storage exceeds 500 square feet, including aisle ways, an operational Fire Code permit is required.

The Fire Code separates combustible and flammable material into various classes based on how combustible the commodity is. Simple descriptions of these classes are presented below. More detailed descriptions are found in the California Fire Code:

- Class I Commodities: These are essentially non-combustible items stored on wooden pallets. Basically, it's the pallets that are the problem here.
- Class II Commodities: These are similar to Class 1 Commodities, except they are packaged in slatted wooden boxes or heavy paper or cardboard, which makes them more combustible.
- Class III Commodities: These are items made of wood, cloth, paper, Group C plastics, or limited amounts of Group A or B plastics. These are more combustible than Class II items.
- Class IV Commodities: These materials include Class I, II, or III items packaged in Group A plastics, Group B plastics, or free flowing Group A plastics. They are more combustible than Class III.
- High Hazard Commodities: These items are more combustible than Class I - IV commodities. Many materials fall into this category, including Group A plastics not previously categorized into Classes I, II, III, or IV.
- Group A, B, & C Plastics: These ratings are based on the "heat of combustion" for these plastics. Group A plastics create the most heat when they burn and burn faster than the other plastics. Group C plastics create the least heat when they burn and burn slower and Group B plastics are between Groups A and C in heat of combustion and burn rate.

What if I have storage that constitutes HPS, but don't want to be regulated as HPS?
There are two options:

1. Reduce the overall storage height to 12 feet or less for Class I – IV commodities and 6 feet or less for high hazard and/or Group A-C plastic storage.
2. Reduce your HPS to an area that takes up less than 500 square feet of floor space, including aisle ways.

Based on business operations, if either option does not work for the business/facility, then a permit for HPS must be obtained. If one of the aforementioned options does work for your facility, it is highly recommended that you provide a floor plan to our office, to show the storage area.

Please note: During inspections, if it is determined that we consistently have to address the overall height of HPS or a storage area exceeding 500 square feet, the facility will be required to obtain an HPS permit.

What is required in order to obtain an HPS permit?
It is highly recommended that a consulting firm that is familiar with HPS analysis prepare the HPS plans for submittal. The Fire District can provide a courtesy list of firms that are familiar with the process and requirements. Please note: The Fire District does not endorse any of the firms identified on the list.

An application is required to be submitted to the Fire District along with plans. Please refer to the Fire District Plan Review Submittal Process handout. This can be obtained on our website at www.chinovalleyfire.org.

Plans for HPS shall include the following:

1. All drawings and plans are to be to scale.
2. A site plan is required. This plan is required to show the following information:
    a. Entire site, including the building or buildings on the site
    b. Location of all fire access lanes, gates and access doors
    c. All fire protection equipment, such as fire hydrants; fire department connections (FDCs); fire sprinkler risers, sprinkler monitoring and fire detection control panels, and fire control room, as applicable.
    d. Knox box locations;
    e. Locations/areas of outdoor commodity storage and/or idle pallet storage; the storage height shall be included.
    f. LP-gas tanks and dispensing equipment; and outdoor or indoor storage of LP-gas fuel cylinders used by forklifts or other industrial trucks.
    g. Areas designated for battery charging systems used by forklifts, including the type of batteries, the capacity per unit, and the combined capacity for the fleet.
3. A floor plan is required. This plan is required to show the following information/uses:
    a. Access and egress doors
    b. All fire protection equipment, such as fire sprinkler risers, sprinkler monitoring and fire detection control panels, and fire control room, as applicable.
    c. The required HPS marking
    d. Office areas/space
    e. Manufacturing areas
    f. Shipping/receiving
    g. Storage areas not classified as HPS.
4. An egress path analysis is required. This analysis is required to identify egress paths and the required emergency exit illumination and directional exit signs, as applicable. The analysis will also serve as a design criteria for the emergency and egress lighting plan submittal.
5. Detailed plans of the proposed high-piled combustible storage area are required. These plans are required to show the following items:
    a. Locations of racks and/or piles
    b. The height of the storage (This is measured from the finished floor to the highest point of the commodity stored, not the highest shelf or tier level).
    c. Required aisles (Aisles are measured from the actual edges of the commodities being stored, not from the edges of the rack uprights).

    d. Location of all steel columns in relationship to the storage area(s) and/or racks. Please note: Steel columns located within a rack flue space or immediately adjacent to a rack in an aisle may require protection. Reference NFPA 13.
6. When a fire detection system is required, include the proposed fire detection methodology.
7. Include the fire sprinkler design criteria based on commodity type, packaging, method of storage, maximum roof height, aisle width, and sprinkler type and temperature ratings per NFPA 13. Include references to specific sections, tables, and figures. Multiple analyses may be required when storage consists of a mix of commodity classifications and/or where storage methods and/or heights vary.
8. When high-piled combustible storage is proposed for a building with an existing fire sprinkler system, provide the design criteria of the existing fire sprinkler system per calculation plate or the approved plans from when the sprinkler system was installed. Determine if the existing fire sprinkler system will meet or exceed the required criteria of NFPA 13. In cases where the existing fire sprinkler system does not meet the design criteria of NFPA13, provide a conclusion that details the upgrades necessary to protect the proposed storage. (See item 7)
9. When smoke and heat removal vents are existing or proposed in buildings with a fire sprinkler system, the fusible links for smoke and heat removal vents shall operate at a temperature that is at least 100 degrees above the sprinkler head temperature. In buildings that do not have a fire sprinkler system, the fusible link temperature shall be between 100 and 220 degrees above the ambient temperature. In buildings that are not environmentally controlled, the ambient temperature is assumed to be 140 degrees. Gravity-operated drop-out vents shall operate at 500 degrees.
10. When mechanical smoke removal is required or proposed, the following information is required:
    a. The proposed location and size
    b. Operation of the smoke removal system, entailing cubic feet per minute (cfm) capacity of the system, adequate make-up air supply, interlocks, and controls per the California Fire and Building Codes.
11. Include details for approved devices or alternate means for maintaining the required transverse and longitudinal flue spaces. Mechanical devices installed to provide flue space protection are allowed to be installed in the required flue space if the cumulative surface area of the devices does not exceed 25% of the area of the flue space that is being protected.
12. The Fire District “High-Piled Combustible Storage Worksheet” is required to be submitted with the package and signed by the facility Manager.