ONTARIO FIRE DEPARTMENT

425 East "B" Street, Ontario, CA 91764-4107
Phone (909) 395-2029 – Fax (909) 395-2585

RACK/HIGH-PILED COMBUSTIBLE STORAGE INFORMATION

WORKSHEET

PROJECT/BUSINESS NAME _____

PROJECT ADDRESS _____

MANAGER/CONTACT PERSON _____ PHONE _____

FIRE DEPT. PLAN CHECK NO. _____ DAB NO. _____

COMMODITY INFORMATION

List all stock to be stored six (6) feet in height or over. (Measure to the top of storage)

Materials	Commodity Classification [Class I, II, III, IV or High Hazard (Group A, B, or C Plastics)]	Max. Height (in feet)	Cartons or Bags	Encapsulated 5 sided (Y/N)	Palletized/ Solid Pile or Racks/ Shelves	If palletized, wood or plastic pallets	Percentage of Overall Storage
						Total	**100% HPS**

Total floor area to be used for high-piled / rack storage _____ sq. ft. for **this permit**
Total floor area to be used for high-piled / rack storage_____ sq. ft. in **entire building**
Note: The total floor area shall include the intervening aisles.

BUILDING INFORMATION

Indicate the building and fire protection features provided in the structure to have the commodity as indicated above.

Roof height: min. _____ ft. max. _____ ft.
Distance from floor to bottom cord of truss/beam _____ ft.
Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement:
min._____in, max._____ in.
Fire sprinkler density ____/_____. ESFR "K" Factor and design pressure K_____ at _____ psi.
Sprinkler head temperature: _____ F
Smoke detection provided: ☐ N/A ☐ Yes ☐ No
Fire hose connections (show locations on floor plan) ☐ N/A ☐ Yes ☐ No
Draft curtain depth _____ ft., area _____ sq. ft. (show locations on floor plan) ☐ N/A
Automatic smoke and heat vents provided (show location on floor plan). Indicate ratio 1:_____ ☐ Yes ☐ No
Link temperature: _____ F
Mechanical smoke removal provided. ☐ N/A ☐ Yes ☐ No

I HEREBY CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND THAT THE STORAGE OF HIGH-PILED STOCK WILL BE LIMITED AS INDICATED ABOVE.

Signature _____ Date_____
(building owner or occupant)

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RACK/HIGH-PILED COMBUSTIBLE STORAGE INFORMATION

CHECKLIST

HIGH-PILED COMBUSTIBLE STORAGE is defined as storage of combustible materials in closely packed pile or combustible materials on pallets, in racks or on shelves where the top of storage is greater than 12 feet in height. When required by the chief, 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. A permit is required to use any building or portion thereof as a high-piled storage area exceeding 500 square feet. Plans shall be submitted with applications for such permits in accordance with 2007 CFC Chapter 23.

Three copies of a floor plan and completed Worksheet, including the information specified in the 2007 CFC, Chapter 23, Section 2301.3, shall be submitted for review and approval. Following approval of the plans, a copy of the approved plans shall be maintained on the premises in an approved location.

If at any time during this process assistance is needed, the Ontario Fire Department has a list of consultants that have experience with this format. Please call for the most current list.

INDICATE THE FOLLOWING ITEMS ON THE ***WORKSHEET***:

- ❑ 1. The useable storage height for each storage area (in the max. height column.)
- ❑ 2. Commodity clearance between top of storage and the sprinkler deflector for each storage arrangement.
- ❑ 3. Locations and classifications of all commodities in accordance with the 2007 CFC Section 2303.1.
- ❑ 4. Types of commodities which are encapsulated on 5 sides.
- ❑ 5. Type and design criteria of fire suppression and fire detection systems, if applicable.
- ❑ 6. Types, locations, sizes, and design criteria of smoke removal and curtain board systems in accordance with Table 2306.2.
- ❑ 7. The total floor area for high-piled stock (include the intervening aisles).

INDICATE THE FOLLOWING ITEMS ON THE ***FLOOR PLAN***:

- ❑ 1. Number of tiers within each rack, if applicable.
- ❑ 2. Maximum pile volume and pile sizes for each storage array.
- ❑ 3. Aisle dimensions between each storage array and rack.
- ❑ 4. Locations and classifications of all commodities in accordance with the 2007 CFC Section 2303.1.
- ❑ 5. Locations and sizes of required fire department access doors.
- ❑ 6. Locations of risers and valves controlling the water supply of ceiling and in-rack sprinklers.
- ❑ 7. Dimensions and locations of transverse and longitudinal flue spaces, in accordance with Table 2308.3.
- ❑ 8. Locations for the vehicle charging stations and ventilation system to show compliance with the 2007 CFC 309.
- ❑ 9. Means for manual release and link temperature on the smoke and heat vents.

Note: Where there is any additional information regarding required design features, commodities, storage arrangement, or fire-protection features within the high-piled storage area, this information shall be provided at the time of permit, as required by the chief.

After completing the checklist, bring at least 3 sets of worksheets and floor plans to the Fire Department counter located at 303 East "B" Street inside City Hall. Plan review fees will be charged at the time of submittal.

ONTARIO FIRE DEPARTMENT

High Piled Combustible Storage Instruction Guide

The intent of this guideline is to provide the requirements for the protection of High Piled Storage (HPS) for a variety of commodities. The following requirements will ensure that the minimum measures required by code have been taken to provide for the public safety and that the required protection of these commodities has been designed in accordance with Chapter 23 of the 2007 California Fire Code (CFC) and referenced standards.

This guideline provides the requirements for all HPS within the jurisdiction of the Ontario Fire Department.

For the purposes of this guideline, certain terms are defined as follows:

High Piled Combustible Storage

The storage of combustible materials 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 and combustible liquids, idle pallets, and similar commodities where the top of storage is greater than six feet in height.

High Piled Storage Area

An area within a building that is designated, intended, proposed, or actually used for high piled combustible storage. For purposes of selecting the applicable fire protection requirement row in Table 2306.2: · This area shall include the “footprint” of the actual storage array (racks, shelves, fixtures, or pallets), inclusive of aisles within the storage area(s). When individual storage arrays are separated by less than 15 foot spaces, the spaces shall be considered aisles and shall be included in a single storage area footprint. When individual storage arrays are separated by more than 15 foot spaces, the individual arrays shall be considered separate storage areas with their own footprint calculation. Each storage area shall also include a 48 inch perimeter aisle calculated in the footprint. This additional perimeter aisle is not required for areas that abut to a wall. For multiple storage areas within a building, the combined total of all high piled storage areas shall be used for selecting the applicable row in Table 2306.2, unless such areas are separated from each other by a one hour rated fire barrier wall constructed in accordance with Section 706 of the California Building Code (CBC). Openings in such walls shall be protected by fire assemblies having a one hour fire protection rating. CFC 2306.3.2.1.

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 three feet vertically. For larger shelves and other storage arrangements see *Rack Storage*.

Solid Shelving

Shelving that is solid, slatted, mesh, or grated located within racks that obstructs sprinkler water penetration through the racks.

1. General

At the time of permit application, plans and specifications, including but 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 Chapter 23 may be of great assistance. A minimum of three sets of plans shall be submitted with the following information per CFC 2301.3:

a. Ontario Fire Department High Piled Storage Worksheet shall be completed and included in all plans and specifications for the HPS project.
b. A scaled site plan that shows the entire building, including all fire access lanes, fire hydrants, fire department connection, and fire sprinkler risers.
c. A scaled floor plan of the building showing locations and dimensions of the HPS area, location of the racks, and access doors to the storage area.
d. The maximum desired/proposed storage height for each designated storage area per array. This height is measured from the finished floor to the highest point of the commodity stored (not shelve level).
e. The number of tiers within each rack.
f. The commodity clearance between the top of storage and the sprinkler deflector for each storage arrangement.
g. Aisle dimensions between each storage array. Aisles are measured from the actual edge of the commodity to commodity, not rack to rack.
h. Maximum pile volume for each storage array.
i. The location and classification of different commodity classes.
j. The location of commodities that is banded or encapsulated.
k. The dimension and location of the transverse and longitudinal flue spaces.
l. The sprinkler design requirements based on commodity type, aisle width, and sprinkler temperature rating as outlined in 2002 NFPA 13, Chapter 12 (e.g., .45/3000 with 286degree heads).
m. The location of all steel columns in relationship to the racks. All steel columns located within a rack flue space or immediately adjacent to a rack in an aisle will require protection. See 2002 NFPA 13, Section 12.3.1.7.
n. The location, make, model, type, and automatic link temperature of the automatic/manual release smoke vents. Fusible links shall be at least one temperature rating higher than the fire sprinklers
o. Requirements for Curtain Boards are provided in CFC Table 2306.2
p. The occupancy group as defined by CBC Chapter 3.

2. Operational Permits—CFC 2301.2

Plans and specifications shall be submitted to the Ontario Fire Department Fire Prevention Bureau as indicated elsewhere in this document. All operational permits will be issued upon plan submittal of the corresponding inspections of the HPS installation. An operational permit is required when a building or portion thereof is used for high piled storage exceeding 500 square feet in area (see the definition of high piled storage area under “Definitions”). Operational permit fees are invoiced annually.

3. Commodity Classification—CFC 2303

Commodities shall be classified as Class I, II, III, IV, or High Hazard, in accordance with CFC Chapter 23. Plastics shall be classified as Group A, B, or C in accordance with CFC Chapter 23. To determine the proper commodity classification of products with limited quantities of Group A plastics in mixed commodities, use CFC Figure 2303.7.4. This figure identifies 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 to "high hazard." The designation and protection features of a high piled combustible storage area intended for storage of different commodity classes shall be based on the highest hazard commodity stored, except as otherwise provided for by engineering analysis in CFC 2304.2.

4. General Fire Protection Provisions—CFC 2306

Fire protection features for high piled storage areas shall be in accordance with CFC Chapter 23 and other nationally recognized standards approved by the Ontario Fire Department. Fire detection systems, smoke and heat removal, and fire sprinkler design densities shall extend to 15 feet beyond the high piled storage area or to a permanent partition, whichever is least. The aggregate of all high piled storage areas within a building shall be used to design the fire protection features found in CFC Table 2306.2, unless such areas are separated from each other by a one hour fire barrier wall constructed in accordance with CBC 706. Distinct occupancy groups shall be separated according to CBC 508.

5. Fire Sprinkler Systems—CFC 2306.4

When fire sprinklers are required by CFC Table 2306.2 or the CBC (or if otherwise provided); the sprinkler system shall be installed in accordance with 2002 NFPA 13.

6. Fire Detection Systems—CFC 2306.5

When fire detection is required by CFC Table 2306.2, an approved automatic fire detection system shall be installed in accordance with 2002 NFPA 72 standard throughout the high piled storage area. This system shall be installed and monitored as required by CFC 907.

7. Fire Department Access—CFC 2306.6

When building access is required by CFC Table 2306.2, 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 2306.2, they shall be provided in each 100 lineal feet of exterior wall and shall face the required access roadway.

8. Smoke and Heat Removal—CFC 2306.7

When smoke and heat removal are required by CFC Table 2306.2, smoke and heat vents shall be of an approved type and shall operate automatically by a heat response device rated between 100ºF and 200ºF above ambient temperatures and contain a manual release roof handle. Vent size shall be in accordance with CFC Table Section 910. The fusible link temperature is required to be at least one temperature rating greater than that of the fire sprinkler head at the roof to prevent early venting.

Smoke and heat vents are *not* required when storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with 2002 NFPA 13. For existing conditions refer to Section 1 N of this document.

9. Curtain Boards

Requirements for Curtain Boards are provided in CFC Table 2306.2

10. Rack Flue Spaces—CFC 2308.3

Requirements for flue spaces within the rack storage are provided in CFC Table 2308.3.

11. 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 305 and 310.

12. Solid Piled and Shelf Storage

Shelf storage, storage in solid piles, solid piles on pallets, and storage in bin boxes not exceeding five feet in any dimension shall be in accordance with CFC 2306 and 2307.

13. Rack Storage

Rack storage shall be in accordance with CFC 2306 and 2308. 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 2308.2.2.

14. Automated Storage

Automated storage similar to carousel storage shall be in accordance with CFC 2309.

15. Specialty Storage—CFC 2310

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 2306 2308, and NFPA 13 and NFPA 230. Palletized storage of records shall be in accordance with CFC 2307.

16. Maintenance—CFC Chapter 9

All fire and life safety equipment and systems required by the CFC shall be maintained operable at all times. Equipment, devices, and systems shall be regularly tested in accordance with nationally recognized standards, manufacturers’ recommendations, and adopted regulations.

17. Technical Assistance

Due to the complexity of the designs specified within the CFC and adopted standards, it may be necessary to obtain the service of a fire protection design professional to assist with developing a protection scheme that meets the requirements of the CFC and other applicable regulations.