



Construction/Operational Permit



High-Piled Combustible Storage

www.cityofvancouver.us/departments/fire-department

International Fire Code as adopted by VMC 16.04 (Washington State Fire Code)

Permitting Requirements

High-piled combustible storage (HPS) is storage of combustible materials in closely packed piles or combustible materials on pallets, in racks, or on shelves where the top of storage is greater than 12 feet in height. HPS 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 separate FRI permit is required in addition to any CMI permit to install racking.

An **operational permit** is required to use a building or portion thereof with more than 500 square feet, including aisles, of HPS, as per WSFC 105.5.24.

A **construction permit** is required for the installation of or modification to a structure with more than 500 square feet, including aisles, of HPS. Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit, as per WSFC 105.6.13.

A separate permit is required to store hazardous materials in excess of the amounts listed in WSFC Table 105.5.22. See the *Hazardous Materials* permit application for more information.

Project Information

Site Address		Owner Name	
Other			

Applicant Information

Company Name		Address		
Contact Name				
Office Phone		Cellular		Email

Contractor

Company Name		Address		
Contact Name				
Office Phone		Cellular		Email
Related Permits:	RES _____	CMI _____	DEF _____	MPE _____

Description of Work

Electronic Plan Standards

File Naming Standards:
 Electronic plans and documents shall be named as specified in the City of Vancouver [ePLANS](https://www.cityofvancouver.us/business/permits-licenses-and-inspections/eplans/) system:
<https://www.cityofvancouver.us/business/permits-licenses-and-inspections/eplans/>

Acceptable File Types:
 Plans, calculations, specifications and supporting documents shall be uploaded as a PDF file.

Plan Sheet Standards:
 All plans shall be drawn to scale, as identified in the checklist, and each sheet shall state the scale and show a measurable scale on the page for measurement calibrations.

Document Orientation:
 All plans must be uploaded in “Landscape” format in the horizontal position with a north indicator. All other documents can be in “Portrait” format.

Stamped:
 Where documentation contains a code analysis or engineering calculations, such documents shall be stamped by the design professional.



Minimum Submittal Checklist for Upload to ePLANS

- Completed Fire Installation Permit Application – High-Piled Combustible Storage (this document) Check all *Permit Conditions* checkboxes that are applicable to your project.
- Supporting documents listed below (See *Document Details* below)
- Site plans and floor plans (see *Plan Details* below)
- Combustible Stock Storage Questionnaire

Document Details

HMMP Guide: <https://www.cityofvancouver.us/wp-content/uploads/2023/10/Hazardous-Materials-Management-Plan.pdf>
 See *Vancouver Fire Department HMMP Guide* for direction on completing required HMMP and/or supplemental forms

Does your business...	If YES, please complete these pages of the HMMP (linked above):	
Store more than 500 square feet, including aisles, of: 1. High-piled combustible storage in piles or on pallets, in racks or shelves where the material being stored exceeds twelve (12) feet in height, or, 2. Tires, Group A plastics, flammable liquids, idle pallets, or similar high hazard materials stored above six (6) feet in height.	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> High-piled or Rack Storage Supplemental Form
Have on site (for any purpose) at any one time, hazardous materials, including hazardous waste, at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs)?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> All HMMP documents

Have on site (for any purpose) at any one time, hazardous materials, including hazardous waste at or above the permit threshold set forth in Section 105.5 of the International Fire Code?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> HMIS <input type="checkbox"/> Site Map and Storage Plan <input type="checkbox"/> <i>Hazardous Materials</i> Permit Application
Own or operate permanent or portable aboveground storage tanks (AST) or underground storage tanks (UST) containing hazardous materials?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> HMIS <input type="checkbox"/> Tank Plan
Store or use any amount of toxic or highly toxic gases?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> All HMMP documents
Store, handle, or manufacture aerosol products?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> Aerosol Supplemental <input type="checkbox"/> Site Map
Store or use explosives or explosive materials, including blasting agents?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> All HMMP documents <input type="checkbox"/> <i>Explosives</i> Permit Application
Store hazardous materials on racks or in piles over 6 feet?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> All HMMP documents
Store or display gunpowder or primers?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> HMIS <input type="checkbox"/> Site Map and Storage Plan

If a full HMMP is required, it must contain the following minimum elements:

- Facility Information Form: Business Activities Declaration page
- Facility Information Form: Business Owner/Operator Identification page
- Hazardous Materials Inventory Statement (HMIS)
- HMIS Hazard Class Summary Report
- Emergency Response/Contingency Plan
- Employee Training Plan
- Recordkeeping
- Facility Site Plan & Storage Map
- Required supplemental forms

In addition to the HMMP document listed above, provide the following documents:

- A Fire Safety and Evacuation Plan prepared in accordance with WSFC 404, where applicable. See *Permit Conditions*.
- Owner's letter of intent highlighting the commodities intended to be stored in the HPS areas, the method of storage and method of packing.

Plan Details

The following is a list of information required on all plan submittals for review of HPS permit. The plan shall be drawn to 1/8" = 1'-0" minimum scale. The applicant is required to submit all applicable information so an accurate and timely review may be completed:

General:

- Site plan to include a north arrow, a measurable scale for calibration purposes, fire hydrants, emergency access lanes, doors, vehicle gates, fire department connection, facility evacuation meeting point locations, sprinkler riser(s), standpipes, fire alarm control panel, Knox Box, and roof access (if provided).
- Floor plan of the building to include locations and dimensions of high-piled storage areas, aisle dimensions between each storage array, maximum pile volume of each storage array, location and classification of commodities, location of commodities that are banded or encapsulated, location of sprinkler riser, location of smoke removal systems (if applicable), and egress analysis in accordance with WSFC Chapter 10.
- Elevations of the storage, including storage height of each storage area, number of tiers of each rack, and commodity clearance between top of the storage and the sprinkler deflectors.
- Narrative sheet to include scope of the project, building type of construction, current and proposed occupancy, description and classification of commodities, type of fire protection systems, location of valves controlling the water supply of ceiling and in-rack sprinklers, type and specifications of smoke removal systems (if applicable).
- Dimension and location of transverse and longitudinal flue spaces.

Permit Conditions

The following is a list of WSFC requirements related to HPS operations and construction of structures serving the HPS. Use this form to confirm that all applicable requirements are met. Non-applicable requirements can be left blank.

General:

- High-piled storage shall be in accordance with WSFC Chapter 32. In addition to the requirements of this chapter, the following material-specific requirements shall apply (WSFC 3201.1):
 - Aerosols shall be in accordance with WSFC Chapter 51.
 - Flammable and combustible liquids shall be in accordance with WSFC Chapter 57.
 - Hazardous materials shall be in accordance with WSFC Chapter 50.
 - Storage of combustible paper records shall be in accordance with NFPA 13.
 - Storage of combustible fibers shall be in accordance with WSFC Chapter 37.
 - General storage of combustible material shall be in accordance with WSFC Chapter 3.
- An approved fire safety and evacuation plan in accordance with WSFC Section 404 shall be prepared for buildings with high-piled combustible storage in any of the following situations (WSFC 403.10.5):
 - The high-piled storage area exceeds 500,000 square feet for Class I-IV commodities.
 - The high-piled storage area exceeds 300,000 square feet for high-hazard commodities.
 - The high-piled storage is located in a Group H occupancy.
 - The high-piled storage is located in a Group F occupancy with an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
 - The high-piled storage is located in a Group M occupancy with an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
 - Where required by the fire code official for other high-piled storage areas.
- Where a fire safety and evacuation plan is required, a copy of the approved plan shall be maintained on the premises in an approved location (WSFC 3201.4).
- Commodities shall be classified as Class I, II, III, IV or high hazard in accordance with WSFC Section 3203 (WSFC 3203.1).
- High-piled storage areas, and portions of high-piled storage areas intended for storage of a different commodity class than adjacent areas, shall be designed and specifically designated to contain Class I, Class II, Class III, Class IV or high hazard commodities. The designation of a high-piled storage area, or portion thereof intended for storage of a

different commodity class, shall be based on the highest hazard commodity class stored except when classification to a lower hazard is justified by an Engineering Analysis in accordance with WSFC Section 3204.2 (WSFC 3204.1).

Housekeeping and Maintenance:

- The structural integrity of racks shall be maintained (WSFC 3205.1).
- Clearance from ignition sources shall be provided in accordance with WSFC Section 305 (WSFC 3205.2).
- Smoking shall be prohibited. Approved "No Smoking" signs shall be conspicuously posted in accordance with WSFC Section 310 (WSFC 3205.3).
- Pile dimensions and height limitations shall comply with WSFC Table 3206.2 (WSFC 3205.6).

General Fire Protection and Life Safety Features:

- Where required by WSFC Table 3206.2, fire detection systems, smoke and heat removal and automatic sprinkler design densities shall be provided to protect the high-piled storage area (WSFC 3206.2).
- The fire safety features required in WSFC Table 3206.2 shall extend to the lesser of 15 feet beyond the high-piled storage area or a full height wall. Where portions of high-piled storage areas have different fire protection requirements because of commodity, method of storage or storage height, the fire protection features required by WSFC Table 3206.2 within this area shall be based on the most restrictive design requirements (WSFC 3206.2.1).
- For the application of Table 3206.2, the size of the high-piled storage areas shall be determined in accordance with the following (WSFC 3206.3):
 - The size of each high-piled storage area shall include the footprint of the actual high-piled storage racks, shelves or piles and the following aisles (WSFC 3206.3.1):
 - a. Interior aisles within the footprint of the storage area.
 - b. An aisle around the perimeter of the footprint with a minimum width as required in WSFC Section 3206.10.1 or the dimension to a full height wall, whichever is less.
 - Where a building contains multiple high-piled storage areas, the aggregate of all high-piled storage areas shall be used for the application of WSFC Table 3206.2 unless the high-piled storage areas are separated in accordance with one of the following (WSFC 3206.3.2):
 - a. High-piled storage areas separated by fire barriers with a minimum fire-resistance-rating of 1 hour constructed in accordance with Section 707 of the International Building Code.
 - b. In buildings equipped throughout with an automatic sprinkler system in accordance with WSFC Section 903.3.1.1, high-piled storage areas separated by 100 feet or more. The area providing the separation shall not contain high-piled combustible storage.
 - High-piled storage areas classified as Class I through IV not separated from high-piled storage areas classified as high hazard shall utilize the aggregate of all high-piled storage areas as high hazard for the purposes of the application of Table 3206.2. Multiple class high-piled storage areas meeting the separation requirements in WSFC Section 3206.3.2 shall be considered as separated. The fire safety features in WSFC Table 3206.2 shall be extended beyond the higher-hazard storage area in accordance with WSFC Section 3206.2.1 (WSFC 3206.3.2.1).

Exception: Multiple class high-piled storage areas do not need to be separated where supported by Engineering Analysis in accordance with WSFC Section 3204.2.
- Automatic sprinkler system requirements based on the presence of pallets shall be in accordance with NFPA 13 (WSFC 3206.4.1).
- Plastic pallets listed and labeled in accordance with FM 4996 or UL 2335 shall be treated as wood pallets for determining required sprinkler protection (WSFC 3206.4.1.1).
- Where fire detection is required by WSFC Table 3206.2, an approved automatic fire detection system shall be installed throughout the high-piled storage area. The system shall be monitored and be in accordance with WSFC Section 907 (WSFC 3206.5).

- Fire apparatus access roads in accordance with WSFC Section 503 shall be provided within 150 feet of all portions of the exterior walls of buildings used for high-piled storage (WSFC 3206.6).
Exception: Where fire apparatus access roads cannot be installed because of topography, railways, waterways, nonnegotiable grades or other similar conditions, the fire code official is authorized to require additional fire protection.
- Where smoke and heat removal is required by WSFC Table 3206.2 it shall be provided in accordance with WSFC Section 910 (WSFC 3206.8).
- Where exit passageways are required by the International Building Code for egress, a Class I standpipe system shall be provided in accordance with WSFC Section 905 (WSFC 3206.9).
- Portable fire extinguishers shall be provided in accordance with WSFC Section 906 (WSFC 3206.11).

Fire Department Access Doors:

- Where fire department access doors are required by WSFC Table 3206.2, fire department access doors shall be provided in accordance with the following (WSFC 3206.7):
 - Fire department access doors are not required in an exterior wall that does not face a fire apparatus access road provided that all of the following conditions occur (WSFC 3206.7.1):
 - a. The opposite exterior wall faces a fire apparatus access road.
 - b. The opposite exterior wall is provided with fire department access doors.
 - c. The entire interior surface of the exterior wall is less than 150 feet (45 720 mm) away from a fire department access door.
 - d. The building is equipped throughout with an automatic sprinkler system in accordance with WSFC Section 903.3.1.1.
 - Where exterior walls surrounding high-piled storage areas face fire apparatus access roads, such walls shall be provided with fire department access doors (WSFC 3206.7.2).
 - Fire department access doors shall be able to be accessed without the use of a ladder (WSFC 3206.7.3).
 - Fire department access doors shall be labeled on the exterior side with the following sign or other approved sign (WSFC 3206.7.4):

FIRE DEPARTMENT ACCESS DOOR
DO NOT BLOCK

The lettering shall be in a contrasting color to the background. Letters shall have a minimum height of 2 inches with a minimum stroke of 3/8 inch.

- The required fire department access doors shall be distributed such that the lineal distance between adjacent fire department access doors does not exceed 125 feet measured center to center (WSFC 3206.7.5).
Exception: The linear distance between adjacent access doors shall not exceed 200 feet in existing buildings where change in occupancy is not proposed.
- Fire department access doors shall be not less than 3 feet in width and 6 feet 8 inches in height. Roll-up doors shall not be considered fire department access doors unless approved (WSFC 3206.7.6).
- Locking devices on fire department access doors shall be approved (WSFC 3206.7.7).
- Where fire department access doors are required, a key box shall be installed in accordance with WSFC Section 506.1. The key box shall contain keys or devices to allow for entry through the fire department access doors (WSFC 3206.7.8).

Aisles:

- Aisles shall comply with WSFC Chapter 10. Additionally, a separating storage piles or racks shall comply with NFPA 13. Aisles providing access to exits and fire department access doors shall be provided in high-piled storage areas exceeding 500 square feet, in accordance with the following (WSFC 3206.10):
 - Aisle width shall be in accordance with the requirements below (WSFC 3206.10.1).
Exceptions: Aisles crossing rack structures or storage piles, that are used only for employee access, shall be not less than 24 inches wide; Aisles separating shelves classified as shelf storage shall be not less than 30 inches wide.

- a. Sprinklered Buildings: Aisles in sprinklered buildings shall be not less than 44 inches wide. Aisles shall be not less than 96 inches wide in high-piled storage areas exceeding 2,500 square feet in area, that are accessible to the public and designated to contain high-hazard commodities. Aisles shall be not less than 96 inches wide in areas open to the public where mechanical stocking methods are used (WSFC 3206.10.1.1).

Exception:

1. Aisles in high-piled storage areas exceeding 2,500 square feet in area, that are open to the public and designated to contain high-hazard commodities, and that are protected by a sprinkler system designed for multiple-row racks of high-hazard commodities, shall be not less than 44 inches wide.
 2. Aisles that are in high-piled storage areas exceeding 2,500 square feet in area, not open to the public and protected by a sprinkler system designed for multiple-row racks, shall be not less than 24 inches wide.
- b. Non-Sprinklered Buildings: Aisles in non-sprinklered buildings shall be not less than 96 inches wide (WSFC 3206.10.1.2).
- The required aisle width shall extend from floor to ceiling. Rack structural supports and catwalks are allowed to cross aisles at a minimum height of 6 feet 8 inches above the finished floor level, provided that such supports do not interfere with fire department hose stream trajectory (WSFC 3206.10.2).
 - Dead-end aisles shall not exceed 20 feet in length in Group M occupancies. Dead-end aisles shall not exceed 50 feet in length in all other occupancies (WSFC 3206.10.3).

Exception: Dead-end aisles are not limited where the length of the dead-end aisle is less than 2.5 times the least width of the dead-end aisle.

Solid-Piled and Shelf Storage:

- Shelf storage and storage in solid piles, solid piles on pallets and bin box storage in bin boxes not exceeding 5 feet in any dimension, shall be in accordance with WSFC Section 3206 and this section (WSFC 3207.1).
- Where automatic sprinklers are required by WSFC Table 3206.2, an approved automatic sprinkler system shall be installed throughout the building or to 1-hour fire barriers constructed in accordance with Section 707 of the International Building Code. Openings in such fire barriers shall be protected by opening protectives having a 1-hour fire protection rating. The design and installation of the automatic sprinkler system and other applicable fire protection shall be in accordance with the International Building Code and NFPA 13 (WSFC 3207.2).
- Shelf storage greater than 12 feet (3658 mm) but less than 15 feet in height shall be in accordance with the fire protection requirements set forth in NFPA 13. Shelf storage 15 feet or more in height shall be protected in an approved manner with special fire protection, such as in-rack sprinklers (WSFC 3207.2.1).
- Pile dimensions, the maximum permissible storage height, and pile volume shall be in accordance with WSFC Table 3206.2 (WSFC 3207.3).
- Where an automatic sprinkler system design utilizes protection based on a closed array, array clearances shall be provided and maintained as specified by the standard used (WSFC 3207.4).

Rack Storage:

- Rack storage shall be in accordance with WSFC Section 3206 and this section. Bin boxes exceeding 5 feet in any dimension shall be regulated as rack storage (WSFC 3208.1).
- The design and installation of storage racks shall be in accordance with the International Building Code (WSFC 3208.1.1).
- Where automatic sprinklers are required by WSFC Table 3206.2, an approved automatic sprinkler system shall be installed throughout the building or to 1-hour fire barriers constructed in accordance with Section 707 of the International Building Code. Openings in such fire barriers shall be protected by opening protectives having a 1-hour fire protection rating. The design and installation of the automatic sprinkler system and other applicable fire protection shall be in accordance with Section 903.3.1.1 and the International Building Code (WSFC 3208.2).

- Storage on plastic shelves shall be protected by approved specially engineered fire protection systems (WSFC 3208.2.1).
- Racks with solid shelving having an area greater than 20 square feet, measured between approved flue spaces at all four edges of the shelf, shall be in accordance with the following (WSFC 3208.2.2):
 - Fire protection for racks with solid shelving shall be in accordance with NFPA 13 (WSFC 3208.2.2.1).
- Racks with mesh, grated, slatted or similar shelves having uniform openings not more than 6 inches apart, comprising not less than 50 percent of the overall shelf area, and with approved flue spaces are allowed to be treated as racks without solid shelves (WSFC 3208.2.2 Exception 1).
- Racks used for the storage of combustible paper records, with solid shelving, shall be in accordance with NFPA 13 (WSFC 3208.2.2 Exception 2).
- Rack storage areas protected with an automatic sprinkler system shall be provided with flue spaces in accordance with WSFC Table 3208.3. Required flue spaces shall be maintained (WSFC 3208.3).
- Flue spaces required by WSFC Table 3208.3 above the first tier of storage in single-, double- or multiple-row rack storage installations shall, where required by the fire code official, be equipped with approved protection devices. Such devices shall not be removed or modified (WSFC 3208.3.1).
- Steel building columns shall be protected in accordance with NFPA 13 (WSFC 3208.4).
- Approval of the fire code official shall be obtained prior to installing extra-high-rack combustible storage. Buildings with extra-high-rack combustible storage shall be protected with a specially engineered automatic sprinkler system. Extra-high-rack combustible storage shall be provided with additional special fire protection, such as separation from other buildings and additional built-in fire protection features and fire department access, where required by the fire code official (WSFC 3208.5).

Automated Storage:

- Where automatic sprinklers are required by WSFC Table 3206.2, the building shall be equipped throughout with an approved automatic sprinkler system in accordance with WSFC Section 903.3.1.1 (WSFC 3209.2).
- High-piled storage areas having greater than 500 square feet of carousel storage shall be provided with automatic shutdown in accordance with one of the following (WSFC 3209.3):
 - An automatic smoke detection system installed in accordance with WSFC Section 907, with coverage extending 15 feet (4575 mm) in all directions beyond unenclosed carousel storage systems and that sounds a local alarm at the operator's station and stops the carousel storage system upon the activation of a single detector.
 - An automatic smoke detection system installed in accordance with WSFC Section 907 and within enclosed carousel storage systems, that sounds a local alarm at the operator's station and stops the carousel storage system upon the activation of a single detector.
 - A single dead-man-type control switch that allows the operation of the carousel storage system only when the operator is present. The switch shall be in the same room as the carousel storage system and located to provide for observation of the carousel system.
- High-piled storage areas with automated rack storage shall be provided with a manually activated emergency shutdown switch and automatic shutdown in accordance with the following (WSFC 3209.4):
 - A manually activated switch shall be provided to initiate the approved automatic shutdown process. The switch shall be clearly identified and shall be in a location approved by the fire code official (WSFC 3209.4.1).
 - Automatic shutdown shall be required for high-piled combustible storage areas greater than 500 square feet. The approved automatic shutdown process shall commence upon any of the following events: Water flow is detected in the automatic sprinkler system, if present; Activation of the fire detection system, if present (WSFC 3209.4.2).

Specialty Storage:

- Records storage facilities used for the rack or shelf storage of combustible paper records greater than 12 feet in height shall be in accordance with WSFC Sections 3206 and 3208. Palletized storage of records shall be in accordance with WSFC Section 3207 (WSFC 3210.1).

- The design and installation of automatic fire-extinguishing systems in archives, vaults and record storage rooms shall be in accordance with NFPA 232 (WSFC 3210.1.1).

NOTE: *This is not intended to be an all-inclusive list. The WSFC requirements listed are intended to ensure that we have adequate information to begin a review of the application. Additional information may be required.*

I understand that all applicable codes apply and that other regulatory codes may also apply. Errors and/or omissions on the plans and corrections from field inspections are the responsibility of the owner/contractor. All work is subject to compliance with City of Vancouver ordinances and laws of the State of Washington.

APPLICANT NAME: _____ APPLICATION DATE: _____

APPLICANT SIGNATURE: _____