



Operational Permit Application

Cellulose Nitrate Film



www.cityofvancouver.us/departments/fire-department

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

Permitting Requirements

Cellulose nitrate film is defined as a motion picture sound recording, still, or flat film that is coated on a support or base consisting essentially of cellulose nitrate.

An **operational permit** is required to store, handle or use cellulose nitrate film in a Group A occupancy.

Project Information

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| 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

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Electronic Plan Standards

File Naming Standards:

Electronic plans and documents shall be named as specified in the City of Vancouver [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 – Cellulose Nitrate Film (this document) Check all *Permit Conditions* checkboxes that are applicable to your project
- Completed Materials Management Plan (HMMP) documents and supplemental documents (*See Document Details* below)
- Site plans and floor plans (*see Plan Details* below)

Plan Details

The following is a list of information required on all plan submittals for review of a cellulose nitrate film 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 and doors, vehicle gates, fire department connection, facility evacuation meeting point locations, sprinkler riser, fire alarm control panel, Knox Box, and roof access (if provided).
- Interior plans showing all access points, film storage rooms/cabinets, motion picture projection rooms, motion picture projectors, the location of shelving and individual containers of film, etc.
- Portable fire extinguisher locations in accordance with WSFC 906.

Permit Conditions

The following is a list of WSFC requirements related to cellulose film operations. Use this form to confirm that all applicable requirements are met. Non-applicable requirements can be left blank.

Motion Picture Projection Rooms (rooms in which ribbon-type cellulose acetate or other safety film is utilized in conjunction with electric arc, xenon or other light-source projection equipment that develops hazardous gases, dust, or radiation):

- Every motion picture machine projecting film as mentioned shall be enclosed in a projection room. Appurtenant electrical equipment, such as rheostats, transformers, and generators, shall be within the projection room or in an adjacent room of equivalent construction Washington State Building Code (WSBC 409.1.1).
- Provisions shall be made for control of the auditorium lighting and the means of egress lighting systems from inside the projection room and from not less than one other convenient point in the building (WSBC 409.4).

- Each projection room shall be provided with rewind and film storage facilities (WSBC 409.5).
- Every projection room shall be of permanent construction consistent with the construction requirements for the type of building in which the projection room is located. Openings are not required to be protected (WSBC 409.2).
 - The room shall have a floor area of not less than 80 sq ft for a single machine and not less than 40 sq ft for each additional machine. Each motion picture projector, floodlight, spotlight or similar piece of equipment shall have a clear working space of not less than 30 inches by 30 inches on each side and at the rear thereof, but only one such space shall be required between two adjacent projectors. The projection room and the rooms appurtenant thereto shall have a ceiling height of not less than 7 ft 6 inch. The aggregate of openings for projection equipment shall not exceed 25% of the area of the wall between the projection room and the auditorium. Openings shall be provided with glass or other approved material, so as to close completely the opening.
 - The enclosure shall be temperature and humidity controlled while nitrate film is present so that the enclosure temperature does not exceed 75°F and the enclosure relative humidity does not exceed 60 percent.
- Ventilation shall be provided in accordance with the International Mechanical Code (WSBC 409.3).
 - Each projection room shall be provided with adequate air supply inlets so arranged as to provide well-distributed air throughout the room. Air inlet ducts shall provide an amount of air equivalent to the amount of air being exhausted by projection equipment. Air is permitted to be taken from the outside; from adjacent spaces within the building, provided that the volume and infiltration rate are sufficient; or from the building air-conditioning system, provided that it is so arranged as to provide sufficient air when other systems are not in operation (WSBC 409.3.1).
 - Projection rooms are permitted to be exhausted through the lamp exhaust system. The lamp exhaust system shall be positively interconnected with the lamp so that the lamp will not operate unless there is the required airflow. Exhaust air ducts shall terminate at the exterior of the building in such a location that the exhaust air cannot be readily recirculated into any air supply system. The projection room ventilation system is permitted to also serve appurtenant rooms, such as the generator and rewind rooms (IBC 409.3.2).
 - Each projection machine shall be provided with an exhaust duct that will draw air from each lamp and exhaust it directly to the outside of the building. The lamp exhaust is permitted to serve to exhaust air from the projection room to provide room air circulation. Such ducts shall be of rigid materials, except for a flexible connector approved for the purpose. The projection lamp of projection room exhaust system, or both, is permitted to be combined but shall not be interconnected with any other exhaust or return system, or both, within the building (WSBC 409.3.3).

Cellulose Nitrate Film Storage Room Requirements:

- Nitrate film in permanent storage shall be in buildings of Type I construction as defined in NFPA 220 (NFPA 40 Section 4.1.1).
 - Buildings with a permanent storage cabinet complying with NFPA 40 Section 6.4 with no more than 51 lb. of film shall not be required to be of Type I construction. Aluminum shall not be used (NFPA 40 Section 4.1.1.1).
 - Decomposition vents and explosion vents shall be of noncombustible construction (NFPA 40 Section 4.1.1.2).
- All rooms where nitrate film is stored or handled shall be separated from each other and from all other parts of the building by partitions having a fire resistance rating of at least 1 hour when tested in accordance with ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials (NFPA 40 Section 4.1.2).
 - The partitions shall be constructed in accordance with NFPA 221 (NFPA 40 Section 4.1.2.1).
 - Film vaults shall be permitted to meet the requirements of NFPA 40 Section 6.3 or Section 6.5 (NFPA 40 Section 4.1.2.2).
 - Partitions shall be continuous from floor to ceiling and shall be anchored securely to walls, floors, and ceilings (NFPA 40 Section 4.1.2.3).
 - Openings in partitions shall be protected by approved fire doors having a 1-hour fire resistance rating, when tested in accordance with ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials, and in-stalled according to NFPA 80 (NFPA Section 4.1.3).

- All rooms where nitrate film is handled, except film vaults, shall be provided with aisles having a minimum width of 36 inches. (NFPA 40 Section 4.2.1). For existing rooms, the minimum aisle width shall be permitted to be 30 inches.
 - Rooms where nitrate film is handled shall have two or more exits that are remote from each other. Film vaults shall not be required to comply (NFPA 40 Section 4.2.2).
 - Doors shall swing in the direction of exit travel. Where not clearly identifiable, exits shall be marked by an "EXIT" sign meeting the requirements of NFPA 101 (NFPA 40 Section 4.2.3).
- Explosion venting shall be provided in rooms or vaults that are used for the storing and handling of nitrate film (NFPA 40 Section 4.3.1).
 - Explosion venting shall not be required for rooms where the total quantity of film not stored in vented cabinets is less than 20,000 ft, or 100 lb (NFPA 40 Section 4.3.1.1).
 - Explosion venting shall be provided in the ratio of 1 ft² of free vent area per each 50 ft³ of room or vault volume (NFPA 40 Section 4.3.2).
- There shall be at least 35 ft² of floor area for each worker in every inspection room (NFPA 40 Section 4.4.1). Not more than 15 persons shall work at any one time in any one room where nitrate film is handled (NFPA 40 Section 4.4.2).
- Tables and racks that are used in connection with the handling of film (e.g., joining, inspection, and assembly tables) shall be noncombustible or of wood construction with no member less than 1½ inches in least dimension (NFPA 40 Section 4.5.1). Tables shall not have racks or shelves beneath them (NFPA 40 Section 4.5.2). Tables and racks shall be kept at least 4 inches away from any radiator or heating apparatus (NFPA 40 Section 4.5.3).
- All electrical wiring and equipment shall comply with NFPA 70 for Class I, Group D, Division 2 locations. The temperature rating of electrical equipment shall be Class T6 (NFPA 40 Section 4.6.1). Motors shall be located or arranged so that film cannot come in contact with them (NFPA 40 Section 4.6.2).

Heating, Cooling, and Refrigeration Equipment:

- Artificial heating in any building or room in which nitrate film is handled or stored, other than a vault, shall be restricted to hot water or steam not exceeding gauge pressure of 15 psi (NFPA 40 Section 4.7.1):
 - Approved electric steam radiators operating at pressures not exceeding gauge pressure of 15 psi and protected with wire mesh guards shall be permitted to be used if they are of the fixed (nonportable) type. Aluminum shall not be used.
 - If the radiators or heating coils of an indirect heating system that uses high-pressure steam are not located in the room or rooms being heated, then the requirements of 4.7.1 shall not be interpreted as prohibiting the installation of such a system. Heat-generating equipment shall be located in a separate room.
- All steam pipes within 6 ft of the floor and where passing through walls, partitions, or racks or near woodwork shall be protected by insulation (NFPA 40 Section 4.7.2).
- All radiators, heating coils, pipes, and returns that are near the floor or located so as to permit contact with any combustible material, waste, or dirt shall be guarded and protected with 1/4 inch mesh, galvanized steel wire cloth (hardware cloth, No. 20 B&S gauge or equivalent). The guards shall be arranged so that they can be lifted for cleaning. The tops of such guards shall be sloped so that they cannot be used as shelves. Guards shall be constructed so that no film can come within 4 inches of the heating surface. Guards shall be constructed with a substantial metal framework that will prevent the wire mesh from being forced against the radiator or pipes (NFPA 40 Section 4.7.3).
- Permanent storage vaults shall be permitted to have refrigeration from air-conditioning systems installed where necessary to provide temperature and humidity control (NFPA 40 Section 4.7.4).

Duct Systems:

- Air-conditioning, warm-air-heating, air-cooling, and ventilating systems that employ ducts shall be installed in accordance with NFPA 90A (NFPA 40 Section 4.8.1).

- Any duct system used for air that is conditioning a film vault or room where nitrate film is handled shall be entirely independent with no duct connecting to any other vault or room (NFPA 40 Section 4.8.2).
 - It shall be permitted to share conditioning air systems among multiple storage vaults where fire- and pressure-rated isolation devices capable of withstanding a gauge pressure of 7 kPa (1 psi) overpressure and a temperature of 1370°C (2500°F) for 40 minutes are installed.
 - Isolation devices shall be located in the supply and return ductwork at the boundary of the vault to contain any incident within the vault, as well as isolate other vaults in the common system.
 - Isolation devices in all connected vaults shall be automatic closing on actuation of the incident detection system in any vault.
 - Incident detection shall be provided in accordance with NFPA 40 6.5.6.8.
 - The isolation devices shall be fully closed within 10 seconds of the actuation of the incident detection system.
- Air shall not be recirculated between vaults (NFPA 40 Section 4.8.3).
 - It shall be permitted to recirculate air to a centralized conditioning air system if there is an incident detection system that closes off the recirculation by means of an isolation device as specified in NFPA 40 4.8.2.1 (see top bullet of previous list)
 - The incident detection system shall meet the criteria stated in NFPA 40 6.5.6.8.
 - The air recirculation shall be fully closed within 10 seconds of the actuation of the incident detection system.

Fire Protection Requirements:

- Automatic Sprinklers (NFPA 40 Section 5.1):
 - Every room, except projection booths and rewinding rooms, where nitrate film is stored or handled in quantities greater than 51 lb, or 10,000 ft, shall be protected by an automatic sprinkler system that is installed in accordance with the requirements of NFPA 13 for Group II extra hazard occupancies.
 - Protection for areas other than film cabinets and vaults shall utilize automatic sprinklers. Protection for film cabinets and vaults, permanent storage or other than permanent storage, shall be permitted to utilize an automatic sprinkler system or a deluge system using fixed spray nozzles or open sprinklers.
 - In areas or rooms where nitrate film is handled and fire protection is required, the area that is protected per sprinkler shall not exceed 64 ft² with sprinklers not being more than 8 ft apart.
 - Water supplies that are acceptable to the City of Vancouver shall be provided. Water supplies for automatic sprinklers shall be based on 20 gpm per sprinkler for 20 minutes for the total number of sprinklers in one vault plus 25 percent of the sprinklers in the communicating fire area (NFPA 40 Section 5.2).
- Fire Extinguishers: Every room in which nitrate film is stored or handled shall be provided with portable fire extinguishers in accordance with NFPA 10 (NFPA 40 Section 5.3)
 - Every room in which nitrate film is stored or handled shall be provided with portable fire extinguishers in accordance with NFPA 10.
 - Film vaults shall not be required to comply with the portable fire extinguisher requirement.
 - Portable fire extinguishers shall be inspected and maintained in accordance with NFPA 10.

Cellulose Nitrate Film Storage Details:

- Nitrate film that is not in process or being worked on shall be stored as follows (NFPA 40 Section 6.1):
 - (1), amounts exceeding 25 lb but not exceeding 750 lb shall be stored in approved cabinets or in vaults. (See Sections NFPA 20 6.2 and 6.3.),
 - (2) amounts exceeding 750 lb shall be stored in vaults (See NFPA 20 Section 6.3.), and
 - (3) permanent storage film shall be stored in permanent storage cabinets or permanent storage vaults, which are subject to the limitations of NFPA 20 Section 6.1(1) and 6.1(2).

Film Cabinets:

- Film Cabinets shall be constructed in the following manner (NFPA 40 Section 6.2.1):
 - The bottom, top, door, and sides of the cabinet shall be at least No. 18 US gauge sheet steel and double walled with 38mm (1½ inch) air space.
 - Joints shall be riveted, welded, or made tight by some equally effective means.
 - The door shall be provided with a three-point latch arrangement, and the door sill shall be raised at least 2 inches above the bottom of the cabinet to retain spilled liquid within the cabinet, as shown in the figure shown below.
 - Cabinets shall have a capacity not exceeding 170 kg (375 lb) or 22,860 m (75,000 ft).
- Shelves shall be made of noncombustible insulating material not less than 3/8 inch thick or of hardwood that is not less than 1 inch thick (NFPA 40 Section 6.2.3).
 - Shelves shall fit tightly to the back and sides of the cabinet. There shall be a clearance of at least 1 inch between the front of the shelf and the inside of the door.
 - Stops or bars shall be provided so that film cans cannot be stored with the front edge less than 3/4 inch from the front edge of the shelf. There shall be no thumbholes or indentations in the shelves that will allow any part of the containers to project forward from the front edge of the shelf.
- Each cabinet having a capacity of more than 51 lb or 10,000 ft of nitrate film shall be provided with a vent to the outside of the building (NFPA 40 Section 6.2.4).
 - The vent shall have a minimum effective cross-sectional area of 14 in² per 100 lb of film capacity.
 - Vent flues shall be of a construction that is equivalent to No. 18 US gauge riveted sheet steel, and, where inside the building, it shall be covered with 1 inch of noncombustible thermal-insulating material.
- Cabinet Protection (NFPA 40 Section 6.2.5):
 - Cabinets having a capacity of more than 75 lb or 15,000 ft of film shall be provided with at least one automatic sprinkler.
 - Where cans are stored on more than one shelf, as shown in NFPA 40 Figure 6.2.1 and as described in NFPA 20 6.2.6.2 or 6.2.6.3, one sprinkler head shall be provided for each shelf.
- For motion picture film (NFPA 40 Section 6.2.6):
 - Film in cabinets shall be in closed metal cans or DOT-authorized containers.
 - Materials other than film shall not be stored in the same cabinet with nitrate film.
 - Where cabinets are provided with individual insulated compartments for each roll, the individual rolls shall not be required to be in cans or other containers.
 - Film cans, if placed on edge, shall be limited to not more than 25 cans per shelf.
 - Film cans, if placed flat, shall be stacked no more than five cans high with not more than three stacks per shelf.

Vaults Other Than Permanent Storage Vaults:

- Vaults shall be constructed in accordance with plans that have been submitted to and approved by the City of Vancouver (NFPA 40 Section 6.3.1).
 - Vaults shall not exceed 750 ft³ in inside volume. Where the height of the vault ceiling results in a vault having a volume greater than 750 ft³, a heavy wire screen of at least 2 inch mesh or equivalent shall be installed below the ceiling to limit the interior vault space to 750 ft³.
 - Walls and floors of vaults shall be of Type I construction and shall have not less than 4-hour fire resistance. Where masonry units have cracks or holes, the surface shall be plastered on both sides with a cement plaster to a minimum thickness of 1/2 inch to prevent escape of gases through wall cracks.
 - Where the ceiling of a vault is a bearing floor, it shall have a fire resistance of at least 4 hours.
 - Where the vault walls extend 3 ft or more above the roof, the vault roof and ceiling shall be permitted to be constructed of noncombustible materials and shall be permitted to serve as an explosion vent.
 - Vaults shall be provided with drains or scuppers to carry automatic sprinkler discharge directly to the outside of the building.

- Existing vaults shall not be required to drain directly to the outside.
- Door openings shall be protected with automatic, self-closing fire door assemblies having a fire protection rating of 3 hours. Such doors shall be installed in accordance with NFPA 80 and, if held open, shall be arranged to close automatically upon actuation of an approved smoke detector that is located in the vault. Existing heavy steel doors or combinations of one swinging and one sliding door, both of steel construction, shall be permitted to be accepted at the discretion of the City of Vancouver (NFPA 40 Section 6.3.2).
- Vaults shall be temperature controlled to maintain temperature at 70°F or less (NFPA 40 Section 6.3.3).
- Each vault shall be provided with an independent decomposition vent having a minimum effective cross-sectional area of 200 in² per 1000 lb of film capacity. In vaults that are provided with explosion venting, the decomposition vent shall be permitted to be omitted (NFPA 40 Section 6.3.4).
 - Existing vaults shall be permitted to be provided with independent vents having an effective minimum cross-sectional area of at least 140 in² per 1000 lb of film capacity.
 - The vent area for a 750 ft³ new vault shall be not less than 2000 in².
 - Vent flues within the building shall be of Type I construction having a fire resistance of 4 hours.
 - The outlet of each vent shall be above the roof, and where vents discharge horizontally, a deflector wall or other device shall be provided to deflect gases upward. Vents shall be located at least 50 ft horizontally from any window or other opening exposed thereby and at least 25 ft from any fire escape on the same or a higher level.
- Vaults, especially those having a window for a vent, shall be arranged so that the nitrate film in the vault is protected against ignition from the following (NFPA 40 Section 6.3.4.6): (1) rays of the sun, wherever the film in the vault is exposed to direct sunlight entering through the vent, and (2) radiated heat entering through the vent opening, as from an exposure fire, wherever the vent is severely exposed by buildings or storage of combustible material or by other openings in the same wall.
 - Each vent shall be protected against the weather by either single-thickness [1/6 inch] glass in a sash arranged to open automatically in case of fire or a hinged hollow metal or insulated vent panel, either of which shall be equipped with an approved releasing device that is placed inside the vault. The vents shall be arranged to open by either temperature or internal pressure of 5 lb/ft². No pane of glass shall be smaller than 200 in² (NFPA 40 Section 6.3.4.7).
 - A light wire screen that is not coarser than 1/8 inch mesh shall be permitted to be placed in each vent. No bars or screens other than this insect screen shall be placed in vent openings (NFPA 40 Section 6.3.4.8).
- Where there is a possibility of fire being transmitted from one vault to another or to another building through open skylights, glass windows, light roof panels, or venting devices, provisions shall be made to prevent that possibility (NFPA 40 Section 6.3.5).
- For film in these vaults (NFPA 40 Section 6.3.6):
 - Racks in film vaults shall be of hardwood or of noncombustible insulating material and shall consist of shelves tightly fitted to walls and vertical baffles.
 - Vertical barriers shall be of noncombustible insulating material that is at least 3/8 inch thick. They shall be spaced to divide the racks into sections of not more than 3 ft in width.
 - Shelves shall be at least 1 inch wider than the diameter of the largest stored container.
 - Metal supports shall be permitted to be used to keep containers in place.
 - Open racks shall be used only for storage of film in standard DOT containers or in insulated boxes.
- Fire protection in vaults shall be provided by a deluge system with directional nozzles meeting the criteria in NFPA 20 Section 6.5.6 (NFPA 40 Section 6.3.7).
 - Sprinkler systems in existing vaults that remain in compliance with the provisions of this standard at the time of installation shall be permitted to be continued in use.
- Light fixtures shall comply with the requirements of 4.6.1. All switches shall be outside the vault and provided with pilot lights to indicate whether vault lights are on or off (NFPA 40 Section 6.3.8).
- Where heat is required to prevent freezing of the sprinkler system, it shall be provided by hot water or low-pressure steam that is limited to gauge pressure of 10 psi maximum pressure. Vault temperature shall not exceed 70°F. Radiators shall be

placed at the ceiling, over aisle spaces, and with pipes. Also, radiators shall be protected by wire guards that are arranged so that film cannot be placed within 12 inches of them (NFPA 40 Section 6.3.9).

- All motion picture film that is stored in vaults shall be in closed metal cans or DOT-authorized containers (NFPA 40 Section 6.3.10).

Permanent Storage Cabinets and Freezers:

- Permanent storage cabinets shall be provided with individual drawers or compartments, each holding not more than 2000 ft of film. Individual compartments shall be separated by 3/8 inches of noncombustible insulating material. Each compartment shall be provided with a hinged damper or similar device to allow release of decomposition gases into the cabinet vent (NFPA 40 Section 6.4.1).
- Permanent storage cabinets shall be provided with automatic sprinklers when holding more than 51 lb of nitrate film (NFPA 40 Section 6.4.2).
- Each permanent storage cabinet having a capacity of more than 51 lb, or 10,000 ft of film shall be provided with a vent to the outside of the building (NFPA 40 Section 6.4.3):
 - The vent required above shall have a minimum cross-sectional area of 14 in² per 100 lb of film capacity.
 - Decomposition vent pipes shall be of No. 18 US gauge riveted steel or equivalent. Where located within the building, decomposition vent pipes shall be covered with 1 inch of noncombustible insulating material.
- Laboratory-grade refrigerators or freezers for flammable materials, complying with NFPA 45 and having a manual defrost mode, shall be permitted for permanent storage of amounts of cellulose nitrate film not exceeding 51 lb (NFPA 40 Section 6.4.4).
 - A freezer or refrigerator complying with NFPA 20 6.4.1 through 6.4.3.2 shall be permitted for permanent storage of cellulose nitrate film in amounts not exceeding 750 lb (NFPA 40 Section 6.4.5).

Permanent Storage Vaults:

- Permanent storage vaults shall not exceed 1000 ft³ in interior volume. Where the height of the vault ceiling results in a vault having an interior volume greater than 1000 ft³ or greater than the volume that is agreed upon by the authority having jurisdiction, then the interior vault space shall be permitted to be limited as described in NFPA 20 6.3.1.1 (NFPA 40 Section 6.5.1).
 - Walls and floors shall be of Type I construction, having a fire resistance of 4 hours. Where masonry units have cracks or holes, the surface shall be plastered on both sides with a cement plaster to a thickness of at least 13 mm (1/2 inch). Equivalent construction that will provide equal fire resistance and prevent escape of gases through wall cracks shall be permitted to be used.
 - Permanent storage vaults shall comply with NFPA 20 6.3.1.3, 6.3.1.4, and 6.3.1.5.
- Door openings in permanent storage vaults shall be protected in accordance with the requirements of NFPA 20 6.3.2 (NFPA 40 Section 6.5.2).
- Vaults shall be temperature controlled to maintain temperature at 70°F or less (NFPA 40 Section 6.5.3).
- Permanent storage vaults shall be provided with decomposition vents meeting the requirements of NFPA 20 6.3.4 (NFPA 40 Section 6.5.4).
 - In vaults provided with explosion venting, the decomposition vent shall be permitted to be omitted.
 - The vent area for a standard 1000 ft³ permanent storage vault shall be not less than 2670 in².
- For film in these vaults (NFPA 40 Section 6.5.5):
 - Permanent storage vaults shall be provided with horizontal shelves and vertical barriers that are spaced so that no more than 2000 ft of film shall be permitted to be placed in each compartment.
 - The spacing between shelves shall be such that the container covers can be lifted approximately 1/2 inch but cannot be lifted completely off the container.

- The shelves shall be separated by vertical barriers so that no more than 2000 ft of film can be placed between vertical barriers.
- Shelves and vertical barriers shall be of noncombustible insulating material that is at least 3/8 inch thick or of hardwood construction that is at least 1 inch thick.
- Containers shall not overhang shelves except where more than one 400 ft can is stored in a single cubby hole, the cans shall be permitted to overhang shelves by no more than 1 inch.
- Racks shall be designed in relation to the sprinkler system so that the open face of each rack structure shall be protected by the sprinkler system.
- For permanent film storage vaults, fire protection shall be provided by a deluge system with directional nozzles installed in accordance with NFPA 15 and meeting the following criteria (NFPA 40 Section 6.5.6):
 - Sprinkler systems in existing permanent storage vaults that remain in compliance with the provisions of this standard at the time of installation shall be permitted to be continued in use.
 - High-velocity open water spray nozzles each capable of providing a discharge rate of 20 gpm at a gauge pressure of 50 psi shall be installed.
 - The design shall be based on a discharge density of 0.68 gpm/ft² over each face of storage racks.
 - The nozzles shall have a combined spray pattern capable of covering the face of the film storage racks.
 - The nozzles shall be installed at the top of the storage shelf array, aimed at the opposite shelf array.
 - Nozzles shall be installed on opposite faces of the storage shelf array in a staggered pattern such that no nozzles are directly opposite one another.
 - The water supply duration shall be a minimum of 20 minutes.
 - The deluge system shall be activated by a signal from one of the following: an air sampling-type smoke detection system or a fixed temperature heat sensitive cable.
- The very early warning detection (VEWD) fast response air sampling system shall be permitted to be sensitive to CO₂ or smoke (NFPA 40 Section 6.5.6.9).
 - The air sampling smoke detection system shall be designed and installed in accordance with NFPA 72.
 - The air sampling smoke detection system shall activate at a point less than 0.6 percent obscuration per 1 ft.
 - The fixed temperature heat sensitive cable shall activate at a temperature not greater than 165°F.
 - It shall be permitted to set lower alarm levels for either type detection device for the purpose of providing early warning of an incident.
 - The fixed temperature heat sensitive cable shall be installed at the top of each shelf array and located so as not to be shielded from heat produced by film combustion from the shelf array.
 - Full water flow shall be discharged from the water spray nozzles within 10 seconds of reaching the set point actuation of the detection system.
 - Actuation of the detection system or the water deluge system shall transmit a signal to a constantly attended location where emergency response can be initiated.
- All electrical wiring and equipment shall comply with NFPA 70 for Class I, Group D, Division 2 locations. The temperature rating of electrical equipment shall be Class T6. All switches shall be outside the vault and provided with pilot lights to indicate whether vault lights are on or off (NFPA 40 Section 6.5.7).
- Where heat is required to prevent freezing of the sprinkler system, it shall be provided by hot water or low-pressure steam that is limited to gauge pressure of 10 psi maximum pressure. Vault temperature shall not exceed 70°F. Radiators shall be placed at the ceiling, over aisle spaces, and with pipes. Also, radiators shall be protected by wire guards that are arranged so that film cannot be placed within 12 inches of them (NFPA 40 Section 6.5.8).
- All film that is stored in permanent storage vaults shall be in closed metal cans or DOT-authorized containers, and the container cover shall not lift off when the container is placed properly in the rack (NFPA 40 Section 6.5.9).

Handling Cellulose Nitrate Film (NFPA 40 Chapter 7):

- Nitrate motion picture and flat film shall be stored in closed metal cans or DOT-authorized containers (NFPA 40 Section 7.2.1).
- Nitrate film shall not be placed or kept under benches, tables, or other surfaces that would shield it from sprinkler discharge (NFPA 40 Section 7.3).
- Scrap nitrate film shall be kept separate from wastepaper and other rubbish. If nitrate film is intermixed with other materials, the mixture shall be treated as nitrate film (NFPA 40 Section 7.4).
 - Scrap nitrate film shall be collected from workrooms at least once daily and removed to a room used for no other purpose. It shall be kept underwater in steel drums or metal containers with tight-fitting covers.
 - Discarded film in full or partial rolls shall be kept in containers in vaults until disposal.
 - Scrap and discarded film shall be disposed of at frequent intervals. Scrap film shall not be baled or burned.

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: _____