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Spray Finishing Submittal Checklist

Electronic Plan Standards

File Naming Standards:

Electronic plans and documents shall be named as specified in **bold type** under "Permitting Requirements". For example, the plans must be named "**Plans**".

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.

Document Orientation:

All **plans** must be uploaded in "**Landscape**" format in the horizontal position. All other documents can be in "Portrait" format.

PROJECT INFO

Site address: _____

Associated Permits: _____

Project name/Tenant: _____

Property Owner: _____

PERMITTING REQUIREMENTS

An IFC Fire Installation Permit is required to for the installation of spray areas or spray booths for the application of flammable or combustible paint, varnish, lacquer, stain, fiberglass resins or other flammable or combustible liquid applied by means of spray equipment in continuous or intermittent processes. A SEPARATE FIRE INSTALLATION PERMIT FOR FLAMMABLE/COMBUSTIBLE LIQUIDS IS REQUIRED FOR ANY PAINT MIXING OR STORAGE ROOM(S) ASSOCIATED WITH THE SPRAY FINISHING OPERATION. **The following information is required at time of application for the Fire Installation Permit:**

- Completed "Fire Installation Permit Application"
- Completed "Spray Finishing Submittal Checklist". Check all checkboxes that are applicable to your project.
- Plans**
- Manufacturer's **Cut Sheets** for spray booth and associated equipment

PLANS

The following is a list of information required on all plan submittals for review of a **spray finishing operation**. The plan shall be drawn to 1/8"= 1'-0" minimum scale. The applicant is required to submit all of this information so an accurate and timely review may be done:

Protection of Operations:

- Electrical wiring and equipment in spray flammable vapor areas shall be of an explosion-proof type approved for use in such hazardous locations. Such areas are considered **Class I, Division 1 or Class II, Division 1** hazardous locations in accordance with the NFPA 70 (1503.2.1.1).
- Electrical equipment, flammable vapor areas or drying operations that are subject to splashing or dripping or liquids shall be specifically approved for locations containing deposits of readily ignitable residue and explosive vapors.
- Electrical wiring and equipment located outside of and within 5' horizontally and 3' vertically of openings in a spray booth or a spray room shall be approved for **Class I, Division 2 or Class II, Division 2** hazardous locations (1503.2.1.3).

PLANS (CONTINUED)

- Exception:** 1. Wiring in rigid conduit, threaded boxes or fittings not containing taps, splices or terminal connections.
2. This provision shall not apply to electrostatic equipment allowed by Section 1507.
- Open flames and spark-producing devices shall not be located in spray spaces or vapor areas or within 20' of such areas unless separated by a permanent partition. Except drying equipment that complies with 1504.7.2 (1503.2.2).
- Exception:** Drying and baking apparatus complying with Section 1504.6.1.2.
- Heated surfaces having a temperature sufficient to ignite vapors shall not be located in vapor area. Space heating appliances, steam pipes or hot surfaces in a spraying area shall be located so they are not subject to accumulation of deposits of combustible residue. Except drying equipment that complies with 1504.7.2 (1503.2.3).
- Metal parts of spray booths, exhaust ducts and piping systems conveying Class I or II liquids shall be electrically grounded in accordance with NFPA 70 (1503.2.5).
- "No Smoking" signs complying with section 310 shall be conspicuously posted in flammable vapor areas and hazardous materials storage rooms associated with flammable finishing processes (1503.2.6).
- Conspicuous signs with the following warning shall be posted in the vicinity of flammable vapor areas, dipping operations and paint storage rooms (1503.2.7):

NO WELDING, THE USE OF WELDING OR CUTTING EQUIPMENT IN OR NEAR THIS AREAS IS DANGEROUS BECAUSE OF FIRE AND EXPLOSION HAZARDS. WELDING AND CUTTING SHALL BE DONE ONLY UNDER THE SUPERVISION OF THE PERSON IN CHARGE.

Spray Finishing:

- Spray booths, spray rooms and spray spaces shall not be alternately utilized for different types of coating materials where the combination of materials is conducive to spontaneous ignition, unless all deposits of one material are removed from the booth, room, or space and exhaust ducts prior to spraying with different materials (1504.5.1).
- Spray-finishing operations conducted in buildings used for Group A, E, I or R occupancies shall be located in a spray room protected with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 and separated vertically and horizontally from other areas with a 1-hr fire resistive assembly in accordance with IBC Section 416.2. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth or limited spraying space approved for such use. (1504.2)
- Exception:** 1. Automobile undercoating spray operations and spray-on automotive lining operations conducted in areas with approved natural or mechanical ventilation shall be exempt from the provisions of Section 1504 when approved and where utilizing Class IIIA or IIIB combustible liquids.
2. In buildings other than Group A, E, I, or R occupancies, approved limited spraying space in accordance with Section 1504.9.
3. Resin application areas used for manufacturing of reinforced plastic complying with Section 1509 shall not be required to be located in a spray room, spray booth or spraying space.

Spray Rooms:

- Spray rooms shall be constructed in accordance with IBC Section 416 and IFC Sections 1504.4 thru 1504.8 (1504.3.1).
- Combustible floor construction in spray rooms shall be covered by approved, noncombustible, non-sparking material, except where combustible coverings, including but not limited to thin paper or plastic and strippable coatings, are utilized over non-combustible materials to facilitate cleaning operations in spray rooms (1504.3.1.1).

Spray Booths:

- Spray booths shall be constructed of approved noncombustible materials. Aluminum shall not be used (1504.3.2.1).
 - Where walls or ceiling assemblies are constructed of sheet metal, single-skin assemblies shall be no thinner than (18 gage) and each sheet of double-skin assemblies shall be no thinner than (20 gage) (1504.3.2.1).

PLANS (CONTINUED)

- The interior surfaces of spray booths shall be smooth and shall be constructed so as to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning, and shall be designed to confine residues within the booth (1504.3.2.2).
- Combustible floor construction in spray booths shall be covered by approved, noncombustible, non-sparking material (1504.3.2.3).
- Means of egress shall be provided in accordance with Chapter 10. Except means of egress doors from pre-manufactured spray booths shall not be less than 30 inches in width by 80 inches in height (1504.3.2.4).
- A clear space of not less than 3 feet shall be maintained on all sides of the spray booth. This area shall be kept free of any storage or combustible construction (1504.3.2.5).

Exception:

1. A spray booth may be located directly against an interior partition, wall or floor/ceiling assembly that has a fire-resistance rating of not less than 1 hour, provided the booth can be adequately maintained and cleaned.
2. A spray booth may be located closer than 3 feet to an exterior wall or a roof assembly provided the wall or roof is constructed of noncombustible material and the booth can be adequately maintained and cleaned.

- The aggregate area of spray booths in a building shall not exceed the lesser of 10 percent of the area of any floor of a building or the basic area allowed for a Group H-2 occupancy without area increases in accordance with the IBC (1504.3.2.6).
- The area of an individual spray booth in a building shall not exceed the lesser of the aggregate size limit or 1,500 s.f.
- One individual booth up to 500 s.f. is allowed in any building (1504.3.2.6, Exception)

Ventilation:

- Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted and for a sufficient time thereafter to allow vapors from drying coated articles and finishing material residue to be exhausted. Spraying equipment shall be interlocked with the ventilation of the spraying area such that spraying operations cannot be conducted unless ventilation system is in operation (1504.7.1).
- Air exhausted from spraying operations shall not be recirculated unless they comply with the exceptions in 1504.7.2.
- Ventilation system shall be designed, installed and maintained so the average air velocity over the open face of the booth, or cross sectional area in the direction of airflow during spraying operations is a minimum of 100 linear feet per minute (1504.7.3).
- Each spray booth/spray room shall have an independent exhaust duct system discharging to the outside (1504.7.5).

Exception:

- Multiple spray booths having a combined frontal area of 18 s.f. or less are allowed to have a common exhaust when identical spray-finishing material is used in each booth. If more than one fan serves one booth, fans shall be interconnected to operate simultaneously.
- Where treatment of exhaust is necessary for air pollution control or energy conservation, ducts may be manifolded if all of the following conditions are met:
 1. The sprayed materials used are compatible and will not react or cause ignition of the residue in the ducts.
 2. Nitrocellulose-based finishing material shall not be used.
 3. A filtering system shall be provided to reduce the amount of overspray carried into the duct manifold.
 4. Automatic sprinkler protection shall be provided at the junction of each booth exhaust with the manifold, in addition to the protection required by Chapter 15.

PLANS (CONTINUED)

- The termination point for exhaust ducts discharging to the atmosphere shall not be less than the following distances (1504.7.6):
 - Ducts conveying explosive or flammable vapors, fumes or dusts:
 - 30 feet from property lines;
 - 10 feet from openings into the building;
 - 6 feet from exterior walls and roofs;
 - 30 feet from combustible walls or openings into buildings which are in the direction of the exhaust discharge;
 - 10 feet above adjoining grade;
 - Other product-conveying outlets:
 - 10 feet from property line
 - 3 feet from exterior walls and roofs
 - 10 feet from openings into the building
 - 10 feet above adjoining grade
- Electric motors driving exhaust fans shall not be placed inside booths or ducts. Fan rotating elements shall be nonferrous or non-sparking or the casing shall consist of, or be lined with, such material. Belts shall not enter the duct or booth unless the belt and pulley within the duct are tightly enclosed (1504.7.7).

Filters:

- Air intake filters that are part of a wall or ceiling assembly shall be listed as Class I or Class II in accordance with UL 900. Exhaust filters shall be required (1504.7.8).
 - Supports/holders for filters shall be constructed of noncombustible materials (1504.7.8.1).
 - Overspray collection filters shall be readily removable and accessible for cleaning or replacement (1504.7.8.2).
 - Visible gauges, audible alarms or pressure-activated devices shall be installed to indicate or ensure that the required air velocity is maintained (1504.7.8.3).
 - Spray booths equipped with a filter roll that is automatically advanced when the air velocity is reduced to less than 100 linear feet per minute shall be made to shut down the spraying operation if the filter roll fails to advance automatically (1504.7.8.4).
 - Discarded filter pads shall be immediately removed to a safe, detached location or placed in a noncombustible container with a tight-fitting lid and disposed of properly (1504.7.8.5).
 - Spray booths using dry filters shall not be used for spraying materials that are highly susceptible to spontaneous heating and ignition. Filters shall be changed prior to spraying materials that could react with other materials previously collected (ie: lacquer when combined with varnishes, stains or primers) (1504.7.8.6).
 - Waterwash spray booths shall be of an approved design so as to prevent excessive accumulation of deposits in ducts and residue at duct outlets. Such booths shall be arranged so that air and overspray are drawn through a continuously flowing water curtain before entering an exhaust duct to the building exterior (1504.7.8.7).

Light:

- Where spraying spaces, spray rooms or spray booths are illuminated through glass panels or other transparent materials, only fixed lighting units shall be utilized as a source of illumination (1504.6.2).
 - Glass panels for luminaires or for observation shall be of heat-treated glass, wired glass or hammered-wire glass and shall be sealed to confine vapors, mists, residues, dusts and deposits to the flammable vapor area. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding 200 degrees F (1504.6.2.1).
 - Luminaires attached to the walls or ceilings of a flammable vapor area, but outside of any classified area and are separated from the flammable vapor area by vapor-tight glass panels, shall be suitable for use in ordinary hazard locations. Such luminaires shall be serviced from outside the flammable vapor area (1504.6.2.2).

PLANS (CONTINUED)

- Luminaires that are an integral part of the walls or ceiling of a flammable vapor area are allowed to be separated from the flammable vapor area by glass panels that are an integral part of the luminaire. Such luminaires shall be listed for use in Class I, Division 2 or Class II, Division 2 locations, whichever is applicable, and also shall be suitable for accumulations of deposits of combustible residues. Such luminaires are allowed to be serviced from inside the flammable vapor area (1504.6.2.3).
- Portable electric lamps shall not be used in flammable vapor areas during spraying operations. Portable electric lamps used during cleaning or repairing operations shall be of a type approved for hazardous locations (1504.6.2.4).

Fire Protection:

- Spray booths and spray rooms **shall be protected by an approved automatic fire-extinguishing system complying with Chapter 9. Protection shall also extend to exhaust plenums, exhaust ducts and both sides of dry filters** when such filters are used (1504.4).
- Portable fire extinguishers complying with Section 906 shall be provided for spraying areas in accordance with the requirements for an extra (high) hazard occupancy (1504.4.1).
- Automatic sprinklers installed in flammable vapor areas shall be protected from accumulation of residue from spraying operations in an approved manner. Bags used as a protective covering shall be 0.003-inch-thick polyethylene or cellophane or shall be thin paper. Automatic sprinklers contaminated by overspray particles shall be replaced with new automatic sprinklers (1504.5.2).
- Where protecting automated spray application operations, automatic fire-extinguishing systems shall be equipped with an approved interlock feature that will, upon discharge of the system, automatically stop the operation of spraying operations and work piece conveyors into and out of the flammable vapor area. Where the building is equipped with a fire alarm system, discharge of the automatic fire-extinguishing system shall also activate the building alarm notification appliances (1504.8.1).
 - A manual fire alarm and emergency system shutdown station shall be installed to serve each flammable vapor area. When activated, the station shall accomplish the functions indicated in Section 1504.8.1 (1504.8.1.1).
 - At least one manual fire alarm and emergency system shutdown station shall be readily accessible to operating personnel. Where access to this station is likely to involve exposure to danger, an additional station shall be located adjacent to an exit from the area (1504.8.1.2).
- Air makeup and flammable vapor area exhaust systems shall not be interlocked with the fire alarm system and shall remain in operation during a fire alarm condition (1504.8.2).

Exception:

Where the type of fire-extinguishing system used requires such ventilation be discontinued, air makeup and exhaust systems shall shut down and dampers shall close.

Drying Operations:

- Spray booths and spray rooms shall not be alternately used for the purpose of drying by arrangements or methods that could cause an increase in the surface temperature of the spray booth or spray room except for the following:
 - The spraying procedure shall use low-volume spray application (1504.6.1.1)
 - Fixed drying apparatus shall comply with this chapter and the applicable provisions of Chapter 21. When recirculation ventilation is provided in accordance with Section 1504.7.2, the heating system shall not be within the recirculation air path (1504.6.1.2)
 - The spraying apparatus, drying apparatus and ventilating system for the spray booth or spray room shall be equipped with interlocks arranged to (1504.6.1.2.1):
 - Prevent operation of spraying apparatus while drying operations are in progress.
 - Purge spray vapors from the spray booth or spray room for a period of not less than 3 minutes before drying apparatus is rendered operable.
 - Have the ventilating system maintain a safe atmosphere within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.
 - Shut off the drying apparatus automatically if the air temperature within the booth exceeds 200 degree F.

PLANS (CONTINUED)

- Except as specifically provided in this section, drying or baking units utilizing a heating system having open flames or which are capable of producing sparks, shall not be installed in a spraying area (1504.6.1).
- When portable infrared drying apparatus is used, electrical wiring and portable infrared drying equipment shall comply with the ICC Electrical Code. Electrical equipment located within 18 inches of floor level shall be approved for Class I, Division 2 hazardous locations. Metallic parts of drying apparatus shall be electrically bonded and grounded. During spraying operations, portable drying apparatus and electrical connections and wiring thereto shall not be located within spray booths, spray rooms or other areas where spray residue would be deposited thereon (1504.6.1.2.2).

Associated Paint Mixing/Storage Room(s):

- Paint mixing/storage rooms or areas shall be designed and constructed in accordance with IBC 414 and IFC Chapters 27 (Hazardous Materials) and 34 (Flammable and Combustible Liquids). **A separate Fire Installation Permit for Flammable/Combustible Liquids is required for any paint mixing or storage rooms associated with the spray finishing operation.**
- The applicant shall provide an HMIS and MSDS cut sheets for all hazardous materials and flammable/combustible liquids stored and used in the building.
- Applicant shall identify the location of all control areas in the building. Control areas are those spaces within a building where quantities of hazardous materials not exceeding the maximum quantities allowed by IFC Chapters 27, and 34.
- The maximum number of control areas within a building shall comply with IFC Table 2703.8.3.2.
- Control areas shall be separated from each other by not less than a 1-hour fire barrier constructed in accordance with the Section 706 of the IBC (2703.8.3.1).
- The required fire-resistance rating for fire barrier assemblies shall be in accordance with Table 2703.8.3.2. The floor construction of the control area and construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating (2703.8.3.3).
- If the quantities of hazardous materials exceeds exempt amounts allowed under IFC Chapters 27 and 34 the paint mixing/storage room shall be classified as the appropriate Group H occupancy based on the materials stored and used.