

Introduction

Fire represents the highest dollar loss to buildings under construction and their related materials. While such fires are not a frequent event, they are severe and costly when they do occur. Essential to reducing fire loss is: 1. Control of ignition sources, such as cutting, welding, temporary heating and electrical, 2. Proper storage and handling of flammable & combustible liquids, 3. Superior housekeeping practices, and 4. Provision of adequate fire protection equipment.

Flammable & Combustible Liquids (NFPA 30 & OSHA)

- Part of the inspection and inventory process should include ensuring that only a day's supply of flammable and hazardous materials, and that only ignition sources in use be present inside the structure.
- Approved or U.L. Listed safety containers should be used for handling of flammable liquids of more than 1 gallon. All flammable liquid fuel containers should be U.L. listed and be provided with spring-loaded caps and flash arresters if stored inside a structure. Plastic fuel containers should not be used. Flammable products should not be co-mingled with non-flammable materials.
- No more than 25-60 gallons of flammable liquids and 25-120 gallons of combustible liquids should be stored in a single storage cabinet, and there can be no more than 3 storage cabinets in a single storage area.
- Storage outside of building shall not exceed 60 gallons per container and 1100 gallons per pile. Piles must be separated by a five foot clear space and not be within 20 feet of a building.
- Storage of propane fuel cylinders (for forklifts) should be confined to low hazard locations outside the structure. The only propane inside the building should be in use on appliances or equipment. Cylinders should be not be mixed, but rather stored separately according to their hazard and compatibility. Cylinders should be secured in an upright position, out of traffic paths, and with caps on valves when not in use.
- Dispensing of all flammable liquids should be done using approved bonding and grounding methods.
- Diesel fuel tanks should be at least 50 feet from the structure under construction. There should be diking in place to prevent spillage and spread of fire.

Cutting & Welding (NFPA 51B)

- Welding operations can result in sparks falling down onto combustible or flammable materials. Sparks should be contained to the area by shielding either the welding operation, the exposed materials, or both.
- The most common examples of hot work include soldering plumbing pipes, welding steel members, burning torch hot roof work (ironing method and open flame method). The following controls should be used to prevent the potential for a fire due to hot work:
 - A written permit with the date and time for which the operation is approved, signed by the approving authority and posted in the area of the operation.
 - **All reasonable movable combustible materials should be removed from the hot work area and floors swept clean. Wood floors should preferably be covered by metal or wet down.**
 - A minimum rated 2A, 10 BC fire extinguisher should be maintained nearby.
 - **A fire watch should be maintained for at least 30 minutes after hot work operations are completed. This is especially important in buildings of complex configuration, large size, or other factors that may provide an opportunity for fire to develop undetected.**
 - Inspection of the area of operation is inspected by a representative of the approving authority to ensure the above is completed prior to permit issuance.

Electrical (NFPA 70, National Electric Code)

The power supplied to temporary wiring should be 1. Properly fused or breakers installed to prevent overloading of circuits, and 2. Disconnected at the end of each workday. All temporary electrical wiring should meet National Electric Code specifications.

Temporary Heating

There are several critical controls to the safe use of temporary heating:

- Only propane tanks connected to approved appliances should be inside the structure.
- Housekeeping, including maintaining the area in the immediately proximity of heating devices free of debris.
- Locating portable units on a clear, level, unobstructed, surface. Under no circumstances should heating units be perched upon skids, stacks of building materials, waste, or debris. They may, however, be installed in elevated positions above the floor by appropriate support methods. The base of heaters should be insulated from combustible floors by a non-combustible material.
- Clearance from combustible materials must be maintained, typically 18" at a minimum. Where plastic sheeting (or visqueen) is used to contain the heat or keep out rain from an area, clearances must contemplate the movement of plastic sheeting by the wind.
- Maintenance should be performed only by designated and experienced staff. Units should be fueled only after cooled down, and hoses & fittings should be checked to verify integrity (i.e. detecting burns or leaks).
- Portable heaters should be equipped with an approved automatic device to shut off the flow of gas to the main burner and pilot light in the event of flame failure.
- All visqueen coverings, used to shelter stored equipment or materials from water/weather hazards, should be fire retardant.

General Fire Hazards

- Accumulations of brush and vegetation in close proximity to construction or material storage present a fire hazard. Prior to the start of construction, such growth should be cut back at least 100 feet from the construction area.
- Responsibility should be assigned to prevent accumulations of packing material and other combustible debris that can build up quickly. This is of particular importance when such accumulations are around potential ignition sources or smoke-sensitive equipment such as mechanical/electrical rooms.
- Dumpsters, other waste disposal containers, and other points of debris accumulation should be placed away from the structure, from storage, and from other areas where there are values of building materials at risk as a result of a dumpster fire. Dumpsters should be removed when full and not permitted to become overfull.
- The construction of any temporary structures/partitions within building should be of fire retardant materials. Materials can also be plywood or similar materials that have been treated by a fire retardant paint or other surface treatment.
- Open or uncontrolled fires of any size should be prohibited (such as for burning of debris or for other purposes).

Fire Extinguishers (NFPA 10 & OSHA 1926)

- Construction fires are fast moving and usually quite severe unless controlled early. Portable fire extinguishers are of greater value on construction sites than in completed structures. Generally, there are more effective operational protection features incorporated into finished buildings. OSHA specifies one 2A fire extinguisher for every 3,000 square feet on construction sites. In practice, small extinguishers are less effective since they are the frequent target of theft and so may not be available for use. For the purposes of property protection, larger multi-use extinguishers are common, and are recommended. In addition, fire extinguishers should be 'readily accessible,' meaning a travel distance of no more than 75 feet between extinguishers.
- A 2 inch garden-type water hose may be substituted for a 2A extinguisher if it:
 - Is no more than 100 feet long
 - Discharges 5 gallons per minute
 - Has a stream range of 30 feet
- A 55-gallon open drum of water with two fire pails may be substituted for a 2A fire extinguisher.
- Extinguishers must be inspected and maintained, and must be deployed to provide reasonably prompt access by all areas. They must be approved by a nationally recognized testing laboratory, and they must be protected from freezing.

- Employees must be trained in the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting. This should be done upon initial employment and at least annually thereafter.
- A fire extinguisher of at least a 10B rating, should be provided within 50 feet wherever over 5 gallons of flammable or combustible liquids are being used, or where 5 pounds or more of flammable gas are in use.

General Fire Protection

- Often, there are site requirements for fire protection. For example, on multi-level buildings under construction, there may be a requirement to maintain a 55 gallon drum of water on each level. It is important to assure that all contractual site requirements are strictly followed.
- Any sprinkler system planned should be made operable as quickly as possible in order to provide protection from fire. If proper safeguards are not observed, this action can result in significant water losses due to freezing of charged sprinkler piping. To prevent water losses, consideration must be given to seasonal conditions. Sprinkler systems should not be brought on-line in winter weather without protection from freezing. In such instances when system components are exposed to cold weather, options include:
 - Filling piping exposed to the cold with antifreeze
 - Dry systems can be charged, assuring the riser is provided with sufficient heating to prevent freezing
 - Provide sufficient heating to prevent freezing, where practical
 - Wait to charge the system until the stage of the job permits sufficient enclosure of the structure to provide heating

PLEASE READ CAREFULLY The information contained in this publication is not intended as a substitute for advice from a safety expert or legal counsel you may retain for your own purposes. It is not intended to supplant any legal duty you may have to provide a safe premises, workplace, product or operation.