

## Construction site fire prevention—Best practices



One of the biggest risks to a construction site or renovation project is fire. A fire can set a project's schedule back, cause damage to a neighboring building, jeopardize a contractor's business and at its worst, cause injury or death to the workers or occupants of a building. Fires can be prevented, or their impact minimized, by following a few of these simple suggestions.

### Fire extinguishers

- Before performing work that generates an open flame or spark, make certain the appropriate type and number of fire extinguishers are in the immediate area. An additional fire extinguisher must be located within 25 feet of the hot work area.
- All fire extinguishers should be accessible, identified and ready for use.
- Know the location of all fire extinguishers in the work area and make sure all employees have been trained in their proper use.
- Never attempt to fight a fire unless trained and instructed to do so.
- Fire extinguishers will be maintained in all company owned and operated vehicles.
- Fire extinguishers will be maintained in all company owned mobile equipment that has an enclosed cab, including cranes, fork lifts, skid steer loaders, excavators, dozers and scrapers.
- Fire extinguishers will be kept in the job site trailer, storage trailers and gang boxes.
- All fire extinguishers will be inspected weekly to ensure they are still in their proper location and fully charged.
- All fire extinguishers must have an inspection tag attached, indicating that it was professionally serviced within the last 12 months.
- When a fire extinguisher is discharged for any reason, the incident must be reported to the site manager and the extinguisher will be removed from service. If a similar size and type of replacement extinguisher is not available, all work in the area must stop until the used extinguisher has been properly serviced.

### Additional fire extinguishers

In addition to already existing building-mounted fire extinguishers, additional fire extinguishers are required in the following situations:

- When a storage room contains more than 60 gallons of flammable or combustible liquids, at least one fire extinguisher shall be located no more than 60 feet from the door or opening to that room.
- A fire extinguisher shall be available on all elevators.
- A fire extinguisher shall be provided on all tank trucks or other vehicles transporting or dispensing flammable or combustible liquids.
- When flammable liquids are stored or dispensed from a bulk tank, a fire extinguisher must be located between 10 and 25 feet of the tank or dispensing valve.

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- Storage locations for propane cylinders shall be provided with at least one fire extinguisher.
- Areas temporarily heated with heaters fueled by propane, natural gas, oil or solid fuel shall be provided with at least one additional fire extinguisher.
- When a kettle is used for melting roofing materials, a portable fire extinguisher shall be located between 10 and 25 feet of the kettle.
- When flammable adhesives are used to apply roofing, at least two fire extinguishers must be available for every 1,000 square feet of exposed adhesive.

### Standpipes

In structures where standpipes are available, the standpipes should be activated as soon as building codes permit. As construction progresses the standpipe will be maintained in such a manner that they are always ready. The standpipes shall be provided with fire department connections on the outside of the structure, at street level and shall be conspicuously marked or otherwise identified. Access to the fire department connections shall not be obstructed. There shall be at least one standard hose outlet, and available hose, on each floor.

### Flammable and combustible liquids and materials

- Only UL listed safety cans, not more than a five-gallon capacity, can be used for handling and use of flammable liquids in quantities greater than one gallon. For quantities of one gallon or less, the original container may be used.
- Flammable liquids will be stored in UL-listed flammable liquid storage cabinets. No more than 60 gallons of flammable liquids shall be stored in one cabinet and no more than three cabinets shall be permitted in a single storage area.
- No more than 25 gallons of flammable liquids shall be stored outside a UL-listed flammable liquids storage cabinet.
- Store oily rags in covered metal containers specifically designed for their disposal.
- Never use an air hose or compressed air to empty gasoline or flammable liquids from drums.
- Keep all heating equipment away from flammable or combustible materials.
- Do not refuel a hot engine or an engine that is running. Clean up spills that occur during fueling, before starting the engine.
- Gasoline is to be used as a motor fuel only.

### Housekeeping

Combustible debris, such as paper, plastic, corrugated packaging materials, scrap wood and saw dust, shall not be permitted to accumulate in or around the construction site. Debris will be cleaned up and removed from the site, daily.

### Smoking

Smoking is a decreasing fire risk, as it is now prohibited on most construction sites.

- When smoking is permitted, all matches and related smoking materials must be discarded in designated containers. A metal bucket containing wet sand and a lid is an effective container for the disposal of smoking materials.
- Smoking is not allowed within 50 feet of any fuel storage or dispensing areas.

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### Compressed gas cylinders

- Each employee using compressed gas, such as propane, acetylene and oxygen, shall be instructed in their safe use.
- Cylinders shall be far enough from the welding or cutting operation that sparks, hot slag or flames will not reach them. When this is impractical, fire resistant shields shall be provided.
- Cylinders shall be placed where they cannot become part of an electrical circuit.
- Cylinders shall not be subjected to flame, hot metal or other sources of artificial heat.
- Fuel gas cylinders shall not be taken into confined spaces.
- Oxygen cylinders, fittings and accessories shall be kept free of oil and grease.
- All manifolds, regulators, couplings, hoses and torches shall be inspected prior to use each day to see that they are in safe condition and free of leaks. Defective equipment shall be taken out of service and repaired or replaced.
- Whenever torches are not used or left unattended for more than 30 minutes the gas supply shall be shut off at the regulator. When working in an enclosed space, the torch and hose shall be removed when the entrant leaves the space.
- When oxygen and acetylene are in storage, they will be separated by at least 20 feet or by a wall no less than 5 feet tall with a one-hour-fire rating.

### Temporary heaters

These precautions shall be implemented when temporary heaters are being used:

- The storage of propane cylinders within a building is prohibited. Cylinders not connected for use are considered “in storage”. To eliminate the need for storage of full replacement cylinders in the area, three cylinders of 100 pounds capacity may be connected together for connection to a heater (a manifold).
- Heaters shall be located at least six feet away from propane cylinders.
- Heaters shall not be directed toward a compressed gas cylinder.
- Heaters shall be located at least 10 feet from tarpaulins, plastic sheeting, or canvas coverings or closures. Coverings and closures shall be securely fastened to prevent being blown onto the heater by the wind.
- Natural or mechanically supplied fresh air and ventilation shall be provided to maintain the health and safety of the workers, ensure proper combustion and prevent excessive temperature rise in the heated area. Carbon monoxide monitors must be used in areas where portable heaters are used in enclosures.
- Portable heating units will only be installed according to the manufacturer’s recommendations.

### Open fires

Open fires of wood, paper or other combustible materials are prohibited. Fires contained in burning barrels or trash cans are also prohibited.

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### Hot work: welding, torching and grinding

Hot work involves welding, soldering, torching, grinding and cutting operations that generate heat, open flames or sparks. Hot works should be avoided, but when these operations need to be performed, the best line of defense encompasses the entire process from pre-work planning, controlling the heat source during the work and a thorough fire watch after the work has been completed. The following requirements shall apply to all hot works operations:

- Hot work shall be permitted only in areas that are, or have been made, fire safe. When work cannot be moved to a safe area, the area shall be made safe by removing combustibles or protecting combustibles from ignition sources.
- Where combustible materials, such as paper clippings, wood shavings, or textile fibers, are on the floor, the floor should be swept clean for a radius of 35 feet. Combustible floors should be kept wet, covered with damp sand or protected by welding blankets.
- Where practical, all combustibles should be relocated at least 35 feet from the work site. Where relocation is impracticable, combustibles shall be protected with flameproof covers or otherwise shielded with metal or non-asbestos guards or curtains.
- Whenever there are floor openings or cracks in the floor, precautions shall be taken so that combustible materials on the floor below will not be exposed to sparks or slag that may drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken windows.
- Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, approved welding blankets should be provided to prevent ignition.
- Ducts and conveyor systems that might carry sparks to distant combustibles should be suitably protected or shut down.
- If welding, torching or cutting is being performed on a metal wall, partition, ceiling or roof, precautions should be taken to prevent ignition of combustibles on the other side. The heat generated by the hot work will pass through the metal to the other side and could ignite combustible materials. Combustibles on the other side of the metal should be relocated. When combustibles cannot be relocated, a fire watch on the opposite side from the work should be posted throughout the duration of the hot work and for the following 90 minutes.
- Hot work shall not be performed in areas where flammable atmospheres exist due to heavy concentrations of flammable paints, gases, fumes, dusts or compounds.

### Fire watch

Frequently, the person who is actually performing the hot work must pay close attention to the work being performed and they are not able to monitor their own surroundings. For this reason, an additional person shall be assigned fire-watch duties, to be performed during the performance of the actual hot work and for an additional 90 minutes after the hot work has been completed.

- The firewatch person shall have no other duties during the performance of the hot work.
- A portable fire extinguisher must be available during the entire firewatch period. The person assigned the fire watch must have been trained in the proper use of the fire extinguisher.
- The firewatch person must be able to communicate directly with the person who is performing the hot work.
- The firewatch person shall also be trained in the proper fire-reporting procedures.

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