Introduction

Fire Hazards on Construction Sites

Fire is an emergency that requires a rapid response. A fire can quickly become uncontrollable. A quick response might prevent major damage and loss of property, however unnecessary risks should not be taken.

The alarm should be raised according to site procedure and others on site should be warned and evacuated. Many sites have one or more designated fire wardens to take control if a fire occurs.

A construction site is very vulnerable to fires. There are many hazards on a construction site which may cause fire, including:

- Hot work creating sparks and molten metal from cutting torches and grinders,
also flashbacks on oxy cutting equipment.

- Poorly maintained plant including mechanical or gas equipment; faulty “O” rings on cutting torches, leaking gas fittings, excessive oil leaks from hydraulic hoses and fittings.
- Spills of flammable, combustible materials like diesel, petrol and thinners that have not been properly cleaned up.
- Excess combustible dust or vapours being ignited by spark or flame.
- Electrical malfunctions, wiring faults or overloaded temporary circuits.
- Storage of incompatible materials such as paper packaging or wood close to flammable materials or hot work processes.
- Overheated plant or machinery.
- Flammable containers such as gas bottles like (LPG), pressure packs, and hazardous chemicals stored inside tradespersons’ panel vans, enclosed metal toolboxes, shipping containers or other unventilated stores which may result in an explosion and fire resulting from leaking fittings.
- Smoking in areas where flammable or volatile materials are present.
- Decanting flammable liquids or refuelling plant with the motor running.
- Areas where volatile chemicals such as two part paints, waterproofing or glues are being applied.
- Deep excavations or open sewer lines where gases such as a build-up of petrol driven motor exhaust fumes or methane may be present.
- Inadequate emergency management procedures and fire fighting equipment. e.g. fire-mains hose reels, fire extinguishers, hazard signs, blocked or obstructed fire exits, smoke detectors, maintenance of emergency resources.
- Inadequate emergency training such as the correct use of fire fighting equipment, hose reels, extinguishers, first aid and rescue, reporting.

Fire risks on construction sites can be greatly reduced and avoided by careful planning. Fire hazards can be reduced by:

- regularly removing accumulated waste materials and dust
- ensuring work activities are appropriately supervised
- working safely - do not weld near chemicals
- properly using and maintaining plant
- safe management and storage of flammable materials
- personnel being well-informed, appropriately trained and follow established risk management plans
- using and obeying appropriate warning signs
- not smoking in areas other than those designated for smoking
- regularly inspecting electrical equipment

**Why does a fire start?**

Fire results when the four elements needed to support combustion – heat, oxygen, fuel and chemical reaction.

1. Enough Oxygen to sustain combustion
2. Enough Heat to reach ignition temperature
3. Some Fuel or combustible material
4. The chemical reaction that is fire
Removing any one of the four elements means that combustion can no longer be supported and the fire can be extinguished.

Methods of removal involve one or more of the following:
- Starvation - removing the source of fuel (e.g., turn off the gas at source)
- Smothering - the removal of oxygen (e.g., use fire blanket)
- Cooling down - to below ignition level (e.g., use correct extinguisher for hot metal)

**Fire Safety Equipment**

Fire safety equipment must be available on every construction site and must be kept in good working order. Work vehicles such as builders’ utilities, work vans, and delivery trucks should also be equipped with small CO2 fire extinguishers.

Fire safety equipment includes:
- Fire extinguishers
- Fire blankets (used for small domestic fires or to wrap around a person whose clothes have caught alight)
- Hose reels and fire mains
- Signage
- Breathing apparatus (used by rescue workers and fire-fighters)

**Fire extinguishers**

Portable fire extinguishers can save lives and property by putting out or containing fires within the capability of the extinguisher. However, they must be of the correct type for the particular fire, and they must be used correctly. Some fire extinguishers can be dangerous if used on the wrong kind of fire.

Different kinds of portable fire extinguishers are distinguishable by their labels and their colour. The standard colours of some portable fire extinguishers were changed in 1999 so you may see the same type of extinguisher in different colours.
<table>
<thead>
<tr>
<th>Type of extinguisher</th>
<th>Colour</th>
<th>Used for fires involving</th>
<th>Dangerous if used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Red</td>
<td>Combustible items such as wood, paper, textiles, plastics and general rubbish.</td>
<td>Electrically energised equipment, oils and fats</td>
</tr>
<tr>
<td>Foam</td>
<td>Red with blue band or label</td>
<td>Combustible items and flammable liquids such as oil, paint, petrol, solvents, glue, waterproofing materials.</td>
<td>Electrically energised equipment</td>
</tr>
<tr>
<td>CO2</td>
<td>Red with a black band or label</td>
<td>Electrically energised equipment such as switchboards and electric appliances and motors. Limited effectiveness on combustibles, flammable liquids, oils and fats.</td>
<td>Electrically energised equipment</td>
</tr>
<tr>
<td>Powder (different kinds are available)</td>
<td>Red with a white band or label</td>
<td>Flammable liquids and energised electrical equipment.</td>
<td>Electrically energised equipment</td>
</tr>
<tr>
<td>Vaporising liquid</td>
<td>Red with yellow band or label</td>
<td>Combustibles and electrically energised equipment.</td>
<td>Electrically energised equipment</td>
</tr>
<tr>
<td>Wet chemical</td>
<td>Red with oatmeal coloured band or label</td>
<td>Combustibles and cooking oils and Electrically energised fats.</td>
<td>Electrically energised equipment</td>
</tr>
</tbody>
</table>

Portable fire extinguishers can be especially effective on a construction site because of the continuous changes and dynamics of the site. They need to be readily available, very visible and provided in sufficient numbers. Guidelines to provide minimum protection for given areas are set out in Australian Standard AS 2444.

The best placement of fire extinguishers can be achieved by carrying out a physical assessment of the areas to be protected. Extinguishers should be:
- located uniformly and consistently across the site
- easily accessible
**Fire Emergency Response**

Fire is an emergency. As with any emergency, you should follow the emergency procedures established for your work site. Remember to KRO:

- Keep calm (K)
- Raise the alarm (R)
- Obtain help (O)

The need for evacuation should be based on a number of factors including:

- perceived level of risk from information gained from the threat
- risks associated with not evacuating - smoke levels, opportunity to exit in the immediate future, fire, oxygen and visibility
- any current circumstances which may add to the risk factor
- established emergency plans

In the event of a fire on your work site follow the instructions of fire wardens or others with the authority to take control. First response firefighting is a specialist skill. Do not attempt to fight a fire unless you have been trained and are confident to do so.

If you do not have first aid training, call for an ambulance or worksite first aid officer.