



**BUILDERS RISK
GUIDE TO LOSS PREVENTION**

PART ONE: FIRE-RELATED EXPOSURES

Prepared by IMUA's

Loss Control and Claims Committee

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I. INTRODUCTION

This is the first of a six part series, including a summary checklist, focused specifically on the loss exposures related to builder's risk.

The potential for significant property damage from **fire** is often greater during the course of construction than after construction is completed. This is due to the fact that unprotected structural members, combustible building materials and construction debris, temporary heating equipment, and "hot work" processes are all involved in the builder's risk construction process. Additionally, during the early phases of building construction, fire suppression systems are often not yet in place or fully operational, thus limiting on-site fire-fighting capabilities. The combination of increased hazards and exposures coupled with a lack of operating fire protection systems can increase the potential for destructive fires.

This Report will address many of these issues as well as provide ideas on how to prevent or mitigate the potential for loss caused by fire.

II. STATISTICAL BACKGROUND

Based upon available industry statistical information obtained from the Insurance Services Office (ISO) indicates that over the most recent five year period (2007-2011) where data are available fire losses account for the largest percentage of Builder's Risk total claim dollars at more than 32% with the highest average claim severity of \$225,255. . On the other hand the frequency of fire losses, to include Lightning, Explosion & Smoke, make up only 6.59% of the total, ranking well behind Theft, Burglary & Robbery, Windstorm and Hail and Water Damage.

III. PROJECT MANAGEMENT RESPONSIBILITY

It is essential that commitment to loss prevention emanates from Project Management, and carries through to field supervisors, tradesmen, craftsmen and laborers. This aspect of loss prevention should be delineated in the Request for Proposal (RFP) between the owner (or owner's representative) and the bidding contractor(s), and be an integral part of the project through to final sign-off.

Project Management, either CM or the General Contractor (GC), must designate an individual dedicated to on-site safety coordination. There should be a written Loss Control Program that identifies both general safety guidelines and specific objectives tailored to the project. A copy of the Loss Control Program is not enough; a written program should be kept as an active part of the job site management.

The safety coordinator must have the authority to both develop and implement safety standards since some will be unique to the operation and/or location. He/she must also make sure that workers engaged in any aspect of the project follow these standards. Management must support good loss control practices with a strict disciplinary policy that punishes, up to and including termination, violation of these standards.

IV. FIRE LOSS CONTROL ISSUES

A written and approved Property Loss Control Program should identify controls for loss prevention and loss mitigation. These measures should reflect anticipated property fire loss hazards germane to demolition and/or construction operations such as:

- A review of the construction site contemplating adjacent exposures that may affect the project as well as accessibility for fire-fighting purposes.
- Input from the administrative unit of the local fire department which will aid in developing the contact, escalation and response plan.
- Fire department site access areas must be clearly identified, maintained and unobstructed at all times. Access to fire hydrants or qualified water supplies for fire-fighting must be readily available whether adjacent to or within the boundaries of the project site.
- Demolition and construction material should be collected as soon as practical. Carting away of discarded materials should be done by a qualified disposal service on a regular, daily if necessary, basis to eliminate accumulation of refuse on the site. Housekeeping is a critical fire control measure. In addition to removal and collection of debris, collection points should be positioned away from buildings. Metal containers with close fitting lids should be used for rags and the burning of any refuse should be avoided but if necessary, it should be well away (at least 150 feet) from buildings.
- Proper handling of combustible and flammable materials is a common sense yet often overlooked aspect of fire prevention. Combustible materials being used in construction need to be stored safely. Spontaneous combustion of paint solvents, oily rags and like materials discarded with trash can lead to a major loss. Store combustible materials planned to be used in the construction safely and considering ordering them as needed to minimize the amount on hand at any one time.
- Electrical issues are a concern. Areas around permanent electrical installations should have good housekeeping to prevent the accumulation of debris or combustible materials near live installations. Temporary electrical equipment should have ground fault circuit interrupters or residual current devices.
- A “No Smoking” policy should be in place, communicated to all personnel and strictly enforced throughout the duration of the project.
- Get a sprinkler system in the building activated as soon as practical
- A thorough on-site inspection by a trained representative of the Project Management team should be done on a daily basis. This site inspection should include:
 - active areas,
 - material storage areas,
 - high hazard areas (flammables, compressed gas),
 - mobile construction equipment storage areas,
 - the perimeter of the project site, and
 - temporary structures

Documentation of these inspections should be recorded in a log and retained for subsequent review as needed. From the underwriter’s perspective, periodic follow-up visits by the company’s loss control representative is a good double check of the aforementioned activities.

Relying only on an initial site visit often does not provide an accurate depiction of daily housekeeping activities.

Electrical Issues- In buildings where there is live electricity and permanent electrical installations, there needs to be good housekeeping to prevent the accumulation of debris or combustible materials near live installations. Also, temporary electrical equipment should have ground fault circuit interrupters or residual current devices.



Wood frame apartment complexes pose a unique Builders Risk challenge



Uncontrolled smoking by contractors poses a fire hazard. This jobsite was littered with cigarette butts inside this wood frame complex.

V. CUTTING, WELDING & BRAZING OPERATIONS

Sometimes referred to as a “hot works” program, cutting, welding, and brazing operations

create a severe property fire loss potential. These operations require specialized loss control procedures and should be performed by qualified personnel. The company designated to conduct such on-site activities should be required to carry out the activities in a safe manner per the Property Loss Control Program. The required site specific or municipality-wide permits must be secured through the authority having local jurisdiction, which in many cases (such as rural or suburban areas) is the insurance company unfortunately. Similarly, the contractor must maintain valid permit(s) throughout the duration of its activities on the project. These 'hot work' permits are usually on a written template or checklist (in double or triplicate copy), and indicate the safety precautions (see below) which should be taken prior to hot work starting, as well as who the designated qualified individual is who is overseeing and supervising all hot work. The designated individual should 'sign off' on the permit. Depending on the scope and complexity of the hot work, these permits can be issued daily, or at a maximum weekly, by the designated qualified individual assigned by the contractor.

When such work is to take place on a particular day, qualified on-site safety personnel should inspect areas to remove exposures that would contribute to a fire condition. As an example, the area around 'hot work' should be clear of combustible materials, optimally within a radius of 35 feet from the point of operation. During the performance of 'hot work', a second individual who is familiar with such operations should be in the immediate vicinity of the work, maintaining a line of sight to adjacent areas -- this second individual's function is commonly referred to as a "fire watch".

The individual on "fire watch" should --

- Keep watch for sparks, slag, and products of combustion with respect to flammable and combustible materials
- Inspect the work area including the areas above and below the work
- Remain on-site and active for at least 30-minutes after operations have ceased

Immediate access to portable [adequate type and size fire extinguishers] or temporary [small diameter hose line connected to charged water system] fire-fighting equipment may minimize the extent of a loss should a fire start. The "fire watch" person should be trained in proper use of such portable fire-fighting equipment.

An overlooked exposure under this category can involve the sweating of joints during the plumbing rough in process. This seemingly small-scale operation has been the proximate cause of some of the largest fire losses because of fire ignition sources hidden in walls or enclosed spaces.

Federal code 29 CFR 1910.119 requires a hot work permit to be issued for hot work operations conducted on or near a covered process. The permit shall document that the fire prevention and protection requirements in 29 CFR 1910.252(a) have been implemented prior to beginning the hot work operations. For most companies the fire marshal, safety engineer or maintenance manager typically issues a hot work permit. A sample hot work permit follows: [Click here](#).



Hot Work operations (such as soldering or welding) require special safeguards; this contractor was using a gas torch with no precautions.

VI. FLAMMABLE LIQUIDS & GASES

Construction projects normally have flammable liquids and compressed (flammable) gases. Proper arrangements for safe supply, storage, and use of such potentially hazardous materials should be defined in the project's Loss Control Program.

The contractor should be knowledgeable about the inherent hazards and required controls associated with such materials. Proper identification and labeling requirements on containers and cylinders should be reviewed prior to acceptance onto the site. Ideally, the supply should be limited to an "as needed" or a 24-hour supply basis. In practice, this is not always possible, so areas for safe storage (for example approved flammable liquids cabinets) need to be designated, identified with clearly visible and legible signs as well as No Smoking signs, and defined with adequate and stable barriers, to prevent toppling, or fencing. Storage and the use of such hazardous materials should be performed in accordance with recognized industry standards (reference NFPA 30 for Flammable Liquids, and NFPA 58 for LPG tank installations), and with documented approval for storage and use by the local authority, as applicable.

Typically, LP (propane) gases used for portable heating devices, and acetylene gas for torches, are common gases found on jobsites. Acetylene is particularly volatile and poses a significant fire hazard so efforts should be made to minimize or eliminate its use by resorting to compression fittings. The bulk storage of these liquids can be in small, 2-pound cylinders up to 100+ pound cylinders, and should be prohibited to be stored within the building. They should be stored in a well-ventilated, designated area away from buildings.

Valve protective caps should be in place and associated supply hoses should be guarded

against physical damages. Certain types of gases have to be segregated from one another such as keeping flammables and oxidizers separate. Bulk installations of propane, for instance, should be installed by a qualified gas supplier.

VII. ROOFING OPERATIONS

The process of applying original roofing or resurfacing an existing roof system often presents significant fire exposure to the entire structure. Such operations can include the presence of flammable compressed gas (for examples roofing tar is melted to approximately 450° Fahrenheit in kettles using LP gas), open flames (vapors from heated tar are flammable and should be kept far away from sources of ignition), combustible materials and construction debris. Therefore, developing and implementing effective safeguards for roofing operations is an essential component of the overall Property Loss Control program.

All roofing operations involving heat sources and/or hot processes should be conducted by qualified personnel. They should be familiar with the scope and extent of the project, have experience with the completion of such activity, and have the capacity to maintain close supervision of the daily activity on the project site.

- Consideration needs to be given to obtaining and using approved materials for the project; having a planned approach to applying the surfacing materials in conjunction with other work being conducted on the project, and performing continuous supervision of the work.
- Work should be conducted in accordance with product design specifications.
- Equipment should be used in accordance with manufacturer's specifications.
- Roof penetrations (vents, skylights, etc.) should be protected against damage. Consideration should be given to proper cleaning of roof vents (lint, grease) prior to surfacing operations to reduce possible ignition sources.
- A designated, qualified "Fire Watch" should be conducted for at least 30 minutes after hot work has been completed. At this time, the inside of the building should also be inspected for signs of fire, smoke or for any debris that may have carried to another area and be smoldering. There should be at least one portable fire extinguisher on the roof level that is properly rated and of sufficient capacity. Refer to NFPA 241 for specifics.

VIII. TEMPORARY ENCLOSURES

Depending upon the scope and duration of the project, it may be necessary for contractors to erect temporary enclosures within an active area of the project. Temporary enclosures can be used for office space, workshops, storage areas for equipment (tools, materials), changing and break areas for workers, security posts; or, to encase a particular area to keep out the weather.

While temporary enclosures such as pre-fab cabins, huts, cargo containers or portable buildings are common on jobsites and are often made of or contain combustible wood, they

should be kept a minimum of 50 feet away from the building under construction. Where this separation cannot be maintained, the enclosures should be constructed of noncombustible materials. Ideally, these structures should be situated away from activity involving equipment and materials overhead. In addition, paths to and from these structures should be well planned out so authorized and emergency personnel along with any materials or equipment can quickly and safely gain access to them

Building 'enclosures' are often used by contractors to help in the drying or 'curing' process of masonry walls and drywall and are often 'draped' over to form a curtain or enclosure. Those curtains should be made of only an 'approved' or 'listed' fire retardant material, in order to limit fire spread potential. This is particularly important for those with a combustible exterior wall material, such as Exterior Foam Insulating System (EFIS), which is a 'false stucco' material comprised of highly combustible foam.

The "No Smoking" policy should be enforced within the enclosed areas. Property loss potential exposures within enclosures (such as storage of flammables, temporary wiring and space heaters) should be anticipated and controlled by Project Management. Heaters should be fixed in place preferably above floor level and protected by guards or other means. Cooking appliances should not be allowed within the enclosures.

If the sprinkler system is active on the project, branch line(s) with properly rated and approved sprinkler head(s) should be properly extended into the temporary enclosure(s).

IX. TEMPORARY HEATING EQUIPMENT

Depending on climatic conditions, portable-heating equipment may be used during the course of construction. Sometimes workers on the job bring personal heaters to keep warm. It can also be used for concrete pours and other operations. The use of such equipment should be considered a property loss exposure and provided with adequate supervision and control.

Regardless of who owns the equipment, it should be Underwriters Laboratory or Factory Mutual listed and approved for use. Unapproved or unauthorized temporary heating equipment should not be allowed on site. If such unauthorized equipment is detected, the unit(s) should be disconnected, quenched, and removed from the site.

Temporary heaters should be placed on a level, non-combustible flooring or platforms. Adequate clearance (in accordance with manufacturers' specifications) should be maintained around the unit. Maintenance and fueling should also be in accordance with manufacturer's specifications and/or recognized standards. Management must ensure working conditions are acceptable and safe.

Portable heaters should be guarded in some fashion to prevent combustible materials from getting close to the appliance.



Improperly Installed Temporary Heating Unit. This unit was installed not in accordance with the manufacturers guidelines (inadequate clearances to combustible building components) and posed an immediate fire hazard to this \$16 million wood frame apartment complex.

X. FIRE PROTECTION EQUIPMENT

Early in the course of construction, certain types of fire protection may not be installed. General fire prevention controls in the loss control plan should reflect recognized industry standards.

At every stage of construction, an essential component of mitigating the scope and extent of fire damage is the immediate availability of fire containment and suppression systems and equipment. It is the responsibility of project management to ensure that fire-fighting equipment is:

- Included in the project specifications and construction schedule
- Properly designed, inspected, and approved
- Properly connected to a reliable supply
- Readily adaptable to local Fire Department equipment.

Installation should be in accordance with recognized NFPA standards and should occur as early in the project as possible. Regular inspection of installed fire suppression systems should be in accordance with recognized industry standards. An active standpipe system should extend to the upper most level of the project and be qualified as in-service by authorized personnel.

Often, fire hydrants, if provided, may not be in service during course of construction, for various reasons or excuses. Every effort should be made by the loss control consultant to confirm such hydrants are in service prior to significant building values being exposed.

Finally, there is no substitute for a properly designed and OPERATIONAL sprinkler system. While most contractors will balk at the request to activate the sprinkler systems prior to the

final week(s) of construction, due to their fear of potential sprinkler leakages and ‘headaches’, the provision of such sprinkler system protection is the only true, reliable method to preventing catastrophic building loss in later construction stages (particularly for combustible building construction). Unfortunately, most builders risk policies do not require or place a deadline on such protection.

XI. OTHER CONSIDERATIONS

Project Management should be on continual watch for newly arising loss potential exposures during the course of the project. Such exposures may have not been initially contemplated. Illustrative examples could include early delivery of combustible materials, or workers who smoke in temporary storage areas on site.

Ready and reliable communication with local emergency personnel must remain active at all times. Qualified personnel should conduct a review of written, “**change orders**” [defined as a modification to the pre-approved plan] that may affect fire protection]. “**Change orders**” could impact the loss control plans in place for the project. An illustrative example might be the rerouting of building mechanical systems that would impact the fire protection system’s effectiveness. Conditions exterior to the actual project that may affect the site or project should be reviewed. For instance, changes to or work being performed on adjacent exposures could negatively affect the building under construction, access to the project site, site security controls, or other property loss exposures. Changes in contractors necessitate advising them to the project’s loss control plan.

Continual review and modification of the loss control plan is imperative in order to keep this document viable and valuable. Any changes made to the plan should be immediately communicated to the site contractors.

XII. CONCLUSION

Fire exposures are high and constantly changing during the course of construction. The responsibility lies with Project Management to make sure that a loss control plan is specific, adequate and most importantly, implemented. Key personnel on site must always know it’s their responsibility to follow these procedures. In the case of a fire, personnel must be trained in mitigating any loss. Because many different types of workers and contractors may come and go during the course of construction, these key “fire watch” and safety personnel must keep everyone informed and remain flexible to handle unanticipated events. Carefully coordinating the protection of the property while supplies and equipment are being used and stored will greatly increase the chances of completing the project with a minimum of downtime and/or damage.

XIII. APPENDIX REFERENCES*

- National Fire Protection Association [NFPA] 30 Flammable and Combustible Liquids Code
NFPA 51B Standard for Fire Prevention During Welding, Cutting, and Other Hot Work
- NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition
Operations
- NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire
Protection Systems

Refer to individual states for their current editions of the above reference.