

Activity 1— Explaining the Effect of Construction and Occupancy

The first column includes a description of a type of construction or a type of occupancy. In the second column, identify the construction or occupancy classification. In the next column, briefly explain how that construction or occupancy affects loss frequency and/or loss severity.

Description	Construction Classification	Effect of Construction on Loss Frequency and Severity
Exterior walls, floors, and roof are made of, and supported by, noncombustible materials but with trim and interior walls that may be made of combustible materials.		
Exterior walls, floors, and roof made of masonry or fire-resistive or other noncombustible material with a fire-resistive rating of between one and two hours.		
Exterior walls made either of combustible material such as wood or noncombustible material such as brick veneer but that have wall supports, floors, and roof made of combustible material.		
Exterior walls made of masonry or of fire-resistive materials with a fire-resistive rating of not less than one hour, and floors and roof made of noncombustible materials with noncombustible supports.		
Self-supporting exterior walls made of masonry such as brick, stone, concrete, hollow concrete block, or other noncombustible materials. Other structural components, such as floors and roof, are		

usually made of combustible materials such as wood.		
Exterior walls, floors, and roof made of masonry or other noncombustible material with a fire-resistive rating of at least two hours and a roof with a fire-resistive rating of at least one hour.		
Description	Occupancy Classification	Effect of Occupancy on Loss Frequency and Severity
Occupancies such as schools, churches, hospitals, and property owned by governmental entities, such as prisons and police stations.		
Businesses that perform an activity or a service for the customer rather than create or sell a product,		
Occupancies such as apartments, hotels, motels, and nursing homes.		
Businesses that buy and sell goods and merchandise, such as department stores, clothing stores, hardware stores, specialty shops, and grocery stores, whether wholesale or retail.		
Occupancies where operations involve converting raw stock into finished products.		
A type of occupancy that may be co-located with other occupancies and where the primary function is office work.		

Answers to Activity 1—Explaining the Effect of Construction and Occupancy

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Description	Construction Classification	Effect of Construction on Loss Frequency and Severity
Exterior walls, floors, and roof are made of, and supported by, noncombustible materials but with trim and interior walls that may be made of combustible materials.	Noncombustible	<ul style="list-style-type: none"> • Common type of noncombustible construction is all-metal construction • Does not add fuel to fire, but heat can damage structural members, leading to building collapse • Increases potential fire damage to contents and human life
Exterior walls, floors, and roof made of masonry or fire-resistive or other noncombustible material with a fire-resistive rating of between one and two hours.	Modified fire-resistive	<ul style="list-style-type: none"> • Lighter noncombustible materials may be used for non-load bearing walls
Exterior walls made either of combustible material such as wood or noncombustible material such as brick veneer but that have wall supports, floors, and roof made of combustible material.	Frame	<ul style="list-style-type: none"> • Very common construction and the most susceptible to fire damage
Exterior walls made of masonry or of fire-resistive materials with a fire-resistive rating of not less than one hour, and floors and roof made of noncombustible materials with noncombustible supports.	Masonry noncombustible	<ul style="list-style-type: none"> • Masonry noncombustible more resistant to fire damage than any of the light noncombustible, joisted masonry, or frame construction types
Self-supporting exterior walls made of masonry such as		<ul style="list-style-type: none"> • Preferable to frame construction because fire loss

<p>brick, stone, concrete, hollow concrete block, or other noncombustible materials. Other structural components, such as floors and roof, are usually made of combustible materials such as wood.</p>	<p>Joisted masonry</p>	<p>severity is usually less</p> <ul style="list-style-type: none"> • Intense fire may leave only walls standing • Mill construction is a type of joisted masonry that uses heavy timber beams which are less susceptible to fire damage than steel beams
<p>Exterior walls, floors, and roof made of masonry or other noncombustible material with a fire-resistive rating of at least two hours and a roof with a fire-resistive rating of at least one hour.</p>	<p>Fire-resistive</p>	<ul style="list-style-type: none"> • Provides the most fire protection
<p style="text-align: center;">Description</p>	<p style="text-align: center;">Occupancy Classification</p>	<p style="text-align: center;">Effect of Occupancy on Loss Frequency and Severity</p>
<p>Occupancies such as schools, churches, hospitals, and property owned by governmental entities, such as prisons and police stations.</p>	<p>Institutional</p>	<ul style="list-style-type: none"> • May have similarities to habitational (e.g., prisons) • Government buildings often insured through pools or other non-insurance programs
<p>Businesses that perform an activity or a service for the customer rather than create or sell a product,</p>	<p>Service</p>	<ul style="list-style-type: none"> • Hazards are specific to the service being performed (e.g., dry cleaners or gas station) • Overheated electrical is one primary source of ignition
<p>Occupancies such as apartments, hotels, motels, and nursing homes.</p>	<p>Habitational</p>	<ul style="list-style-type: none"> • Occupancies are often not in the control of the building owner, so detecting or controlling hazards can be difficult • Superior habitational occupancy results when the owner performs most of the building maintenance • Wide range of ignition sources, especially cooking • Hospitality occupancies may be affected by economy, and vacancy rate is a key measure

<p>Businesses that buy and sell goods and merchandise, such as department stores, clothing stores, hardware stores, specialty shops, and grocery stores, whether wholesale or retail.</p>	<p>Mercantile</p>	<ul style="list-style-type: none"> • Combustibility varies depending on type of merchandise sold • Stock is susceptible to smoke and water damage • Some mercantile businesses allow smoking, which increases the combustibility risk
<p>Occupancies where operations involve converting raw stock into finished products.</p>	<p>Manufacturing</p>	<ul style="list-style-type: none"> • Each occupancy must be considered and evaluated on its own merits • Extensive electrical systems • Friction generated by manufacturing process
<p>A type of occupancy that may be co-located with other occupancies and where the primary function is office work.</p>	<p>Office</p>	<ul style="list-style-type: none"> • Relatively low-hazard category because materials in offices are usually of limited combustibility • Office occupancies can exist in any type of structure and often share a building with other occupancies • Primary ignition source is electrical wiring and lighting equipment • Computer systems particularly susceptible to fire fighting efforts

Building Protection and External Exposures

Activity 1 — Describing Building Protection and External Exposures

Questions	Answers
1. Risk control measures for hostile fires fall into these two groups.	
2. In addition to mechanical or electrical detection devices, they help detect fires.	
3. When working with a public fire department, the risk management professional should consider these factors.	
4. This system uses water, chemicals, carbon dioxide, and foam as extinguishing agents.	
5. This type of system is particularly appropriate for occupancies that are especially susceptible to water damage, such as computer rooms or libraries.	
6. These are the two risk control measures for internal fire protection.	
7. For this type of fire-fighting device, education is an important part of risk control and includes training on the locations of the device, discharge ranges, capabilities and limitations, and methods of use.	
8. This system can detect a fire and suppress it using water or other extinguishants.	
9. A firefighters' data packet that is retained on the premises at a designated location includes this information.	
10. This type of system allows firefighters to operate in a high-rise building without having to pull in hoses, and play an especially important role in getting hoses into service on upper floors.	

Questions	Answers
11. This is one of the basic functions of virtually every alarm device.	
12. This is an advantage of using a drypipe system.	
13. Many alarm devices are meant to signal the occurrence of a fire to these parties.	
14. This fire class has a heat or fuel source of combustible metals, such as magnesium, titanium, zirconium, sodium, and potassium.	
15. Internal fire suppression is achieved by using a combination of these risk control measures.	
16. To guard effectively against an exterior environment exposure, an organization should do this.	
17. This risk control measure may be set to respond to heat, rate of temperature increase, smoke, flame, or a combination of these.	
18. Construction considerations of the surrounding environment for neighboring buildings from which a fire may spread include these.	
19. Automatic water sprinkler systems rely on water supplied from sources such as these.	
20. In terms of where an alarm signal is received, these are the five basic types of fire alarms.	
21. For a Class C fire class, this type of suppression agent should be used.	

Answers to Activity 1 — Describing Building Protection and External Exposures

Questions	Answers
1. Risk control measures for hostile fires fall into these two groups.	What are internal (or private) fire protection and external (or public) fire protection?
2. In addition to mechanical or electrical detection devices, they help detect fires.	Who are security guards?
3. When working with a public fire department, the risk management professional should consider these factors.	What are the: <ul style="list-style-type: none"> • distance from the fire department to the organization's property, • terrain and obstructions that might interfere with the fire department's response, and • time it takes for the fire department to respond to a fire?
4. This system uses water, chemicals, carbon dioxide, and foam as extinguishing agents.	What is an automatic fire suppression system?
5. This type of system is particularly appropriate for occupancies that are especially susceptible to water damage, such as computer rooms or libraries.	What is a preaction system?
6. These are the two risk control measures for internal fire protection.	What are detection and suppression?
7. For this type of fire-fighting device, education is an important part of risk control and includes training on the locations of the device, discharge ranges, capabilities and limitations, and methods of use.	What are fire extinguishers?
8. This system can detect a fire and suppress it using water or other extinguishants.	What is a sprinkler system?

Questions	Answers
9. A firefighters' data packet that is retained on the premises at a designated location includes this information.	<p>What is:</p> <ul style="list-style-type: none"> • plot plan of the property • description of the facility's construction, hazardous contents and production operations, • fire protection levels, • utility shutoff valves, and • any other data vital to the fire department personnel in controlling a fire?
10. This type of system allows firefighters to operate in a high-rise building without having to pull in hoses, and play an especially important role in getting hoses into service on upper floors.	What is a standpipe system?
11. This is one of the basic functions of virtually every alarm device.	What is automatically emit a signal to alert people to take appropriate actions?
12. This is an advantage of using a drypipe system.	What is being installed in unheated buildings?
13. Many alarm devices are meant to signal the occurrence of a fire to these parties.	Who are the fire-suppression personnel off-site and personnel at a municipal fire department station?
14. This fire class has a heat or fuel source of combustible metals, such as magnesium, titanium, zirconium, sodium, and potassium.	What is Class D?
15. Internal fire suppression is achieved by using a combination of these risk control measures.	<p>What are:</p> <ul style="list-style-type: none"> • Automatic fire suppression systems • Fire extinguishers • Standpipe systems?
16. To guard effectively against an exterior environment exposure, an organization should do this.	What is evaluate and control exterior exposures?

Questions	Answers
17. This risk control measure may be set to respond to heat, rate of temperature increase, smoke, flame, or a combination of these.	What are fire detection devices?
18. Construction considerations of the surrounding environment for neighboring buildings from which a fire may spread include these.	What are: <ul style="list-style-type: none"> • Building materials • Building height and area • Wall openings?
19. Automatic water sprinkler systems rely on water supplied from sources such as these.	What are: <ul style="list-style-type: none"> • public water, • gravity tanks, • in-ground tanks, or • natural bodies of water?
20. In terms of where an alarm signal is received, these are the five basic types of fire alarms.	What are: <ul style="list-style-type: none"> • local alarms, • auxiliary alarms, • remote alarms, • proprietary alarms, and • central station alarms?
21. For a Class C fire class, this type of suppression agent should be used.	What is a suppression agent that will not conduct electricity; conductive agents present a life safety threat?

Life Safety

Activity 1 — Describing Life Safety of Persons Exposed to Fire in Buildings

Questions	Answers
1. Life safety engineers have identified these two characteristics of groups of individuals that affect susceptibility to injury or death caused by a building fire. What are they?	
2. How are life safety risk control techniques and specific measures determined?	
3. By considering the general characteristics of both building occupants and occupancy, safety engineers have developed specific fire safety standards for buildings. These standards are codified in this publication.	
4. What are the four characteristics of individuals that life safety engineers have identified that affect susceptibility to injury or death caused by a building fire?	
5. How many classes of occupancy and related concerns have life safety engineers identified?	
6. What is the result of failing to comply with applicable provisions of the Life Safety Code is usually a legal requirement?	
7. What is the difference between fire safety and life safety?	
8. What are the considerations for the awareness of fire characteristics that affect building occupant's susceptibility to fire?	
9. List six of the twelve classes of occupancy and related concerns identified by life engineers.	

Answers to Activity 1 — Describing Life Safety of Persons Exposed to Fire in Buildings

Questions	Answers
1. Life safety engineers have identified these two characteristics of groups of individuals that affect susceptibility to injury or death caused by a building fire. What are they?	<ul style="list-style-type: none"> • Density (crowding) • The extent to which the occupants can be controlled in their response to the fire
2. How are life safety risk control techniques and specific measures determined?	Jointly by the characteristics of the people in the building (the occupants) and what the building is used for (the occupancy).
3. By considering the general characteristics of both building occupants and occupancy, safety engineers have developed specific fire safety standards for buildings. These standards are codified in this publication.	<ul style="list-style-type: none"> • Life Safety Code®
4. What are the four characteristics of individuals that life safety engineers have identified that affect susceptibility to injury or death caused by a building fire?	<ul style="list-style-type: none"> • Age • Mobility • Awareness of the fire • Knowledge of the building
5. How many classes of occupancy and related concerns have life safety engineers identified?	Twelve
6. What is the result of failing to comply with applicable provisions of the Life Safety Code is usually a legal requirement?	Failing to comply is not only a breach of an ordinance (resulting in fines and other penalties) but can also indicate negligence in failing to adequately safeguard others. Consequently, not complying with the Life Safety Code increases the likelihood not only of property and personnel losses but also of liability losses.
7. What is the difference between fire safety and life safety?	<ul style="list-style-type: none"> • Fire safety—The risk control measures used to protect people and property from the adverse effects of hostile fires. • Life safety—The portion of fire safety that focuses on the minimum building design, construction, operation, and maintenance requirements necessary to assure occupants of a safe exit from the burning portion of the building.

Questions	Answers
<p>8. What are the considerations for the awareness of fire characteristics that affect building occupant's susceptibility to fire?</p>	<ul style="list-style-type: none"> • Whether occupants are awake or asleep • Whether occupants are affected by drugs or alcohol • Whether occupants' attention is affected by diversions such as sporting or entertainment events • Whether occupants in one part of a building are unable to detect a fire in another part of a building
<p>9. List six of the twelve classes of occupancy and related concerns identified by life engineers.</p>	<p>Answers may include:</p> <ul style="list-style-type: none"> • Assembly • Educational • Daycare • Healthcare • Ambulatory Healthcare • Detention and Correctional • Residential • Residential Board and Care • Mercantile • Business • Industrial • Storage

Valuing Physical Property

Activity 1—Matching Definitions of Legal Interest in Property

Match the statements in the left-hand column with the terms in the right hand column.

Statements	Terms
1. This type of creditor has a right to reclaim property for which it has extended a loan.	A. Bailor
2. This term refers to modifications to rented property that tenants intend to remove and take with them when they vacate the premises.	B. Ownership interest
3. When physical property is or sold, this document should stipulate when the property's title transfers from seller to buyer.	C. Landlord's interest
4. This person gives his or her physical property to someone else under a bailment contract.	D. Improvements and betterments
5. This term refers to how much of a property someone owns.	E. Bailment
6. This type of property interest is created when a renter has a legally protected interest in property that they do not own.	F. Sales contract
7. This person temporarily holds someone else's physical property.	G. Limited bill of lading
8. This term refers to permanent alterations made by a tenant to rented property that become a part of the property.	H. Trade fixtures
9. This type of property interest is created when an organization regularly rotates its delivery trucks through an auto repair facility for routine maintenance.	I. Bailee
10. This type of property interest remains with a property owner that rents out his or her property to another person.	J. Secured creditor
11. This type of creditor must make a general claim against the assets of an organization that has	K. Tenant's interest

defaulted on its loan.	
12. Using this type of contract, a common carrier may lower its liability for damage to a shipper's property to an amount that is less than the property's full value.	L. Unsecured creditor

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Assessing and Treating Physical Property Risk

Educational Objective (EO)

Given information on a physical property, assess the risk and recommend treatment options for protecting lives and property.

Case Study—Mellford Propane

Mellford Propane is an independent distributor of portable propane cylinders sold through home improvement stores, hardware stores, and grocery and convenience stores. Retail customers exchange empty propane tanks for full tanks at outdoor kiosks located in front of the store. Mellford trucks collect the empty cylinders and bring them back to the Mellford plant. At the plant, workers refill the portable tanks from large storage tanks. Drivers exchange these refilled tanks for the empty tanks as they service the store kiosks.

Mellford services approximately 500 of these kiosks, which typically contain twenty-five to thirty cylinders at any one time. Mellford's tank exchange business is highly seasonal, with the peak season occurring during the spring and summer months.

Propane is a relatively safe energy source, although it is highly flammable and the cylinders would pose an explosive hazard if ruptured. The delivery trucks that service the store kiosks typically carry ninety cylinders at a time.

Mellford's plant sits on forty acres of land in a low-lying rural area. The land is adjacent to a large creek that feeds a large river, and the river is a major source of water for a nearby city. The plant site includes a small office building, the storage tanks for the propane, a vehicle service area where the ten delivery trucks are fueled and serviced. A 5,000-gallon underground gasoline storage tank is located on the premises. Oil, grease and other lubricants are stored in a small shed in the service area. Excess portable propane tanks are stored in a small warehouse.