

I. INTRODUCTION

A. Purpose:

1. To reduce the amount of damage to property by fire, heat, smoke, gases, water, and firefighting operations. Although some damage will be attributed to fire ground operations, the objective is to minimize the damage to property, while successfully extinguishing the fire. When performing salvage operations remember that caution is the watchword, but speed counts.
2. To present guidelines for the use of salvage equipment.
3. To define care and maintenance of salvage equipment.

B. Background: Salvage is the protection of buildings and their contents from both direct and indirect damage. According to the National Fire Protection Association, indirect damage totaling approximately 75 percent of total fire loss is caused by the extinguishing operations and other events occurring after the fire.

Direct damage totaling approximately 25 percent represents the loss actually caused by the fire. Strong early efforts by fire ground personnel will increase efficient salvage operation and greatly reduce the total loss inconvenience to a structure and its occupants. In addition, effective salvage leads to good public relations.

1. The success of salvage operations are attributed to being ingenious and making use of the materials at hand to enable effective and timely salvage at the scene of an emergency.
2. Victims of fire and other disasters recognize and appreciate the Department's efforts when irreplaceable personal belongings and other contents of a home or business are saved through efficient salvage work.

C. Scope: This instruction applies to all sworn Department personnel.

D. Author: The Chief Deputy of the Emergency Operations Bureau, through the Training Services Section, is responsible for the content, revision, and periodic review of this instruction.

E. Definition: Salvage is the protection of buildings and their contents from unnecessary damage due to water, smoke, heat, and other elements.

II. RESPONSIBILITY

- A. All sworn personnel are responsible for adhering to the information contained in this policy.
- B. Incident Commanders shall ensure that salvage is an integral part of the objectives contained in the Incident Action Plan (IAP) for any emergency or non-emergency response.
- C. Company Officers shall:
 - 1. Ensure that salvage equipment is properly maintained and inventoried at the appropriate administrative site.
 - 2. Ensure that members in their command are proficient in the use, deployment, care, and maintenance of salvage equipment.

III. OVERVIEW

- A. Salvage Objectives:
 - 1. To effect entry with forethought and use of proper tools to avoid the indiscriminate damage of property.
 - 2. To reduce water damage by covering contents of a structure on or below the fire floor and avoid indiscriminate use of water during firefighting operations.
 - 3. To protect the structure and contents by relieving the building of water accumulated during firefighting operations or other causes.
 - 4. To prevent unnecessary damage during ventilation.
 - 5. To prevent unnecessary damage to structure and contents during overhauling operations by systematic investigation of premises, careful opening and use of water, and protecting contents from further damage.
- B. Strategic Priorities: The type of incident (fire, flood, etc.) will dictate strategic priorities relating to salvage operations. Other factors to be considered may include, but are not limited to:
 - 1. Preplanning occupancies before an incident as part of fire prevention.

2. Type and size of structure.
 3. Type of construction.
 4. Type of occupancy:
 - a. Residential: Begin with irreplaceable personal belongings, such as family photographs and other items of possible sentimental value. Proceed with clothing, electronic equipment, furniture, etc.
 - b. Commercial: Priority must be given to occupancy infrastructure, such as any bookkeeping materials, records, and computers, then to merchandise.
 - c. Industrial: Begin with bookkeeping materials, records, and computers, followed by machinery and raw materials used in the business.
 5. Progression of incident at time of arrival.
 6. Value of contents.
 7. Automatic fire protection systems.
 8. Possible location of records and files (including computers).
 9. Personnel available to complete the task.
 10. Salvage equipment available.
 11. Arson or other intentional causes:
 - a. Recognize the cause of the fire or incident.
 - b. Protect and preserve all evidence.
- C. Size-Up: Salvage size-up begins upon receipt of the alarm. The size-up system used for a fire can be easily adapted to salvage operations.

Consider the following:

1. Facts: Nature of incident, type of occupancy, type of construction.

2. Probabilities: Estimation of salvage progress, possible hazards, and weather.
 3. Available Resources: Type and quantity necessary to perform effectively.
 4. Decision: What are the salvage objectives?
 5. Plan of Operation: How to accomplish the salvage objectives.
- D. Tactical Considerations: Controlling indirect damage is the primary objective of salvage operations. Consider the following:
1. Forcible Entry: Know how to gain access with a limited amount of damage. The amount of damage is equated in relation to the urgency of the situation.
 - a. No immediate life hazard and no significant sign of fire define a less destructive means of entry than breaking down a door or taking out a window.
 - b. Small fires can be quickly handled by fewer firefighters, thus reducing the possibility of damage to household furnishings, merchandise, or fixtures by an excessive array of firefighters and equipment.
 - c. Immediate life hazard and/or high fire hazard requires implementing the necessary entry measures to complete the incident strategic objectives.
 2. Ventilation: Proper ventilation practices will reduce the indirect damage caused by heat and smoke.
 - a. Horizontal Ventilation: Opening doors and windows while advancing hose lines to place water on the seat of the fire in a coordinated fire attack fashion will decrease indirect damage.

Salvage materials may be deployed as the fire attack operation is being initiated. Following the knock-down of a fire, hydraulic ventilation utilizing a fog steam pattern from a hand line will aid firefighters in reducing both direct and indirect damage.
 - b. Vertical Ventilation: Although performing topside ventilation will increase direct damage to a building, the long-term results decrease indirect damage by removing heat, smoke, and gases from the occupancy that would otherwise travel throughout the

building unchecked. Creating a survivable space for possible victims and a more tenable environment for firefighters provides improved access to locate and extinguish an existing fire.

- 1) Smaller vertical ventilation operations may require covering the hole or other openings with plastic before leaving the scene.
3. Application of Water: Make every attempt to locate the seat of the fire and use only as much water as is necessary to control the existing conditions.
 - a. Burst hose lines, leaking couplings, and nozzle shut-offs will create unnecessary water damage and should be immediately addressed.
- E. Salvage Plan: May be enacted by a single resource, group, or as a component following initial firefighting operations and personnel rehabilitation.

IV. POLICY

- A. All personnel shall initiate salvage operations as soon as possible in accordance with the IAP in an effort to reduce the loss of property and any building contents.

V. PROCEDURES

- A. Pre-Fire Salvage Operations
 1. Fire prevention inspection activities or area familiarization by operations personnel may be used to pre-plan and forecast salvage needs inside commercial, industrial, or apartment complex occupancies in the event of a fire, flood, or other disaster.
- B. Fire Salvage Operations
 1. Covering of stock, furniture, fixtures, machinery, etc., to protect against damage from water and debris incidental to fire extinguishment and overhaul operations.

2. Ventilating the structure for the protection of members working in the involved property.
3. Diverting and removing water from the building by diking, damming, or containing water flow.
4. Removing contents where it is not possible to provide protection.

C. Post-Fire Salvage Operations

1. The removal of water from floors and basements.
2. The removal of smoke and odors from premises involved in fire.
3. The removal of debris and damaged stock from the fire building or area.
4. Reactive sprinkler systems.
5. Provide temporary protective covering for overhead openings or exposed stock to provide protection against the weather.
6. Search for, and recover, articles or records of value.
7. If the structure is not secure from unauthorized entry, notify law enforcement.

D. Removing Water From Buildings (Dewatering)

1. When dewatering a building, care should be exercised not to channel water where it may enter into basements, low areas of buildings, or adjoining property.
2. Channeling water into sinks or bathtubs may remove water more effectively. Additionally, the toilet drainpipe can serve as an effective outlet for water after removal of the fixture.
3. The use of stairways is quick and effective, with the best results being obtained by laying salvage covers lapped and rolled to control the flow of water.



4. The most practical means of draining water from upper floors is by using chutes constructed on floors below the water and draining through windows or doors.



5. Cutting holes from floor to floor represents more difficulty and requires more time to execute. This method should only be used when other means are not available.
 - a. The extra weight of water and potential for further damage in multi-story buildings warrants extra consideration.
6. In multi-story buildings, seal any opening between the pipe and the floor with rags, sawdust, etc. This will minimize leakage past the drain pipe floor junction to lower portions of the building.
7. Water should not be channeled into vertical shafts due to the possible existence of machinery at the bottom of the shaft and the eventual necessity of removing water.
 - a. Water can be directed down an elevator shaft as long as there is assurance that the basement has been checked in advance for drainage and that all machinery and other materials are protected from further damage.
8. Basements

- a. Plumbing may be utilized by removing the associated fixtures for access to drainage.
- b. Pumps, siphons, educators, and sump pumps should be employed where necessary.
- c. Electrical utilities to low-lying areas should be turned off immediately.

9. Using Hose to Dewater a Structure:

- a. Two rescue team members and one section of 2½” hose can effectively channel water to a desired location by stretching the section of hose between the two members.
 - 1) Use of rubberized hose is an option.
 - 2) Synthetic hose filled with air from the swift water rescue appliances are helpful.
- b. Pulling the hose across a floor will collect and accumulate water to a desired location.

E. Fire Sprinkler System Activation in Buildings

- 1. Caution must be exercised while securing the fire sprinkler system flow upon an active fire environment.
 - a. Large losses may result if improper control of valve handling is exercised, if there is a failure to supply sprinkler system with water, or neglecting to place system back in operation after fires.



Outside Screw and Yoke (OS & Y) Type Fixture



Post Indicator Valve (PIV) Type Fixture

- b. The use of sprinkler stops or tongs are invaluable in stopping excessive flow of water and, in many cases, should be used before trying to find and shut off main control valves.



2. Water removal may be coordinated by a Single Resource, Salvage Group Supervisor, or a Systems Group Supervisor.

F. Covering of Goods and Materials

1. Cover sections where water will appear first, and select the most valuable and the most easily coverable objects.
2. Whenever practical, rugs should be rolled and placed over heavy articles of furniture prior to using salvage covers.
3. Pictures, lamps, and fragile articles should be grouped together before covering. Valuables may be placed in drawers for safekeeping.
4. Reckless covering of fragile materials may produce more damage than would have occurred if they were allowed to remain uncovered.
5. Shelving against walls is difficult to cover unless a space exists between wall and shelving.
6. Showcases with glass tops must be protected to prevent breakage during covering operations.

7. Belt-driven machinery is hard to cover and much thought must be given during pre-planning.
8. Finished or unfinished materials or products on floor, particularly in clothing manufacturing plants, must be removed and protected.
9. Distribution of covers to upper floors of buildings is sometimes challenging. However, elevators may only be used to speed up the operation upon the approval of the Incident Commander.
10. It is helpful for firefighters to be familiar with the operation and handling of mechanical moving equipment (i.e., lift trucks, etc.) to move merchandise stored in warehouses.
 - a. Removing or stacking large or heavy stock before covering will reduce the number of covers necessary.
 - b. Stacks should be made in areas which are less likely to be exposed to water.
 - c. Avoid light fixtures or any openings in the ceiling, as they are channels for water to travel.

VI. EQUIPMENT

A. Salvage Covers

1. Cover specifications range in size from 9' x 12' to 14' x 18'. The most common size in use is 12' x 18'.
 - a. Size: The 12' x 18' covers shall have a tolerance of three inches, plus or minus two inches, in either width, length, or both.
 - 1) The 12' width of the cover is considered the end of the cover.
 - 2) The 18' width of the cover is considered the side of the cover.



- b. Fabric: Treated cotton duck cover. One side is impregnated with material providing a “water-proof” or scotch-guarding effect.
 - 1) Salvage covers have an upside and a downside.
 - 2) All edges shall be hemmed by turning under 1½” of material to make two thicknesses of goods all around the edge of the covers.
- c. Grommets: The 12’ x 18’ covers shall have 24 brass grommets located two at each corner, five at each side, and three at each end.



- 1) All corners are reinforced on the underside of the cover with a 7-1/2” triangular piece of the same material as is used in the body of the cover so as to provide three thicknesses of goods for the corner grommets.
2. Care and Maintenance
- a. Covers shall be washed thoroughly with a mild soap, and hung as soon as possible upon returning to the Fire Station.

- b. Covers shall be inspected carefully before folding to ensure that they are completely dry, clean, and in good condition before being placed in service again.
- c. Salvage covers in need of repair shall be sent to Camp 9 with a Form 47 stating the nature of repair and location.
- d. Covers shall not be folded near broken glass or debris.
- e. Throwing covers from roofs, windows, or other openings above the ground floor is **prohibited**.
- f. Personnel shall exercise care when removing covers from stock or machinery, and avoid pulling them over sharp objects.
- g. If it is necessary to hang covers during salvage operations, only rope, nails, or S-hooks shall be placed through grommets.

3. Inspection

- a. Personnel shall inspect salvage covers quarterly and after each use for signs of wear, perforations, or other damage.
 - 1) The quarterly inspection shall include completely unfolding, and physically and visually inspecting both sides and each component of the salvage cover.
 - 2) Salvage covers are similar to folded hose in that organic materials may collect on infrequently deployed covers.
 - 3) Completed inspections shall be recorded in the Station business journal.

4. Storage of Salvage Covers

- a. The most common storage technique is to horizontally stack folded covers into a 3' x 12' compartment area.

B. Plastic Sheeting (Visqueen)

- 1. Plastic sheeting provides the following advantages:
 - a. Large quantities can be easily stored on the apparatus.
 - b. Sheeting can be left at the scene indefinitely.

- c. Large areas can be quickly and easily covered with minimal personnel.
 - d. Plastic sheeting can be easily cut to the proper length or shape required.
 - e. Sheeting is easily installed on horizontal and vertical surfaces. To cover vertical areas, plastic sheeting can be stapled to a wall:
 - 1) This makes it an excellent choice for "bagging" a room prior to pulling a ceiling during a creeping attic fire.
 - 2) Upon completion of an incident, the plastic and staples can be removed, leaving only small staple holes on the walls and a relatively clean, dust free environment throughout the rest of the structure.
 - 3) Placing an ordinary playing card between the plastic and staples can be used to assist in preventing staples from pulling through the plastic.
 - f. Because sheeting is disposable, it can be left at the scene.
 - g. Provide an additional vapor barrier under salvage cover.
 - h. Ideal if the area to be covered exceeds the standard 12' x 18' salvage cover.
 - i. Provide protection for valuables required to be covered for an extended period of time.
 - j. If salvage covers were initially used, they can be replaced with plastic prior to leaving the scene.
 - k. Protect the floors below the incident from water.
 - l. Ideal if there is limited personnel available for the task.
2. Disadvantages of Plastic Sheeting
- a. Prone to mechanical damage, such as rips and tears.
 - b. Prone to melting from ambient heat and causing further damage to materials and property.

- c. Prone to holes from burning embers.

3. Specifications

- a. Plastic sheeting is available in many thicknesses. The Department usually supplies six millimeter-thick sheeting.
- b. Usually purchased in 20'W x 100'L and folded into a 32" wide roll.

C. Salvage Cover Folding and Deployment Techniques

1. Folding Salvage Covers

- a. The folding operation requires a minimum of two members. However, three to four members is optimal.
- b. Spread salvage cover on a clean and dry surface.
- c. Members position themselves at each end of the cover.
- d. Members kneel facing one another, placing the outside hand, palm down, on the end of the cover, approximately three feet in from one corner.
- e. Reach across the outside arm with the inside hand; grasp the turned in corner.
- f. Fold the side into the center of the cover by bringing the inside arm to the center and pulling tight so that the side is straight.
- g. Repeat steps d, e, and f, above on the opposite side.
- h. With all edges aligned, remove the trapped air between the folds by running two 36" floor brooms, overlapped, along the length of the cover.
- i. One member kneels on one on each side of the cover, placing the hand nearest the end palm down on top of cover and thumb over the cover, 12 inches from the end.
- j. Fold cover over the hand used as a reference point, placing the fold even with the edge.

- k. Continue folding the cover in an accordion fashion, until cover is folded into a 12' x 3' pack. The thumb on the reference point is used as a guide to keep the folds even.



2. Two Member Payout



- a. Members position themselves even with one end of the object to be covered.
- b. The first member holding the cover (the holder) faces the direction the cover will payoff. The second member faces the holder.
- c. The holder stands with the folded cover placed over their forearms, the top edge toward the second member.
- d. The hands are grasping the cover, palms up, fingers vertically along the front folds, fingertips tucked in between the first and second folds.
- e. The second member grasps the top of the cover by placing the hand palms down, directly above the holder's hands, with thumbs between the hemmed edge and first fold.

- f. After visually assuring that the path is not obstructed, the member paying off the cover walks backward.
- g. Both members elevate and maintain tension on the cover to prevent ground contact.
- h. With the cover paid out, personnel move laterally towards the ends of object to be covered.
- i. Place cover on material and secure as needed.

3. One Member Payout



This technique shall be used only when covering non-breakable objects, such as counters, furniture, and stacked goods.

- a. With top hemmed end of the cover facing the body, grasp with one hand placed under the cover, palm up, fingers vertically along the forward folds, fingertips tucked in between the second and third folds.
- b. Place the throwing hand on top of the cover in the center at the edge toward the body, palm down, the thumb tucked in between the 3rd and 4th folds.

4. Joining Covers (Splicing)



- a. Place covers over object. Fold the end of one cover back for a one-foot lap. Place the edge of the second cover even with the end of the first cover.
- b. With one member on each side of the cover, roll the two ends together.
 - 1) Covers should be rolled in the same direction of the water flow.

5. Salvage Cover Basin (Catch-All)



- a. Spread out the cover, preferably at or very near the intended use location.
- b. Fold each corner inward 45 degrees (approximately three feet).
- c. Roll the sides inward (approximately two feet).
- d. Pull remaining corner material over and tuck under the cover sides. The weight of the water will hold the corners down.
- e. Roll the ends inward 2-3 feet and tuck each corner to form a basin.

6. Techniques – Plastic Sheeting (Visqueen)

- a. A wooden broom handle can be inserted through the roll with a strap attached to facilitate carrying and dispensing plastic.



- b. One member stands at the end of object and holds the handle supporting the roll of plastic, while another member grasps the free end of the plastic and walks away, facing direction of travel and pulls sufficient plastic to cover object.



- c. When sufficient plastic has been removed, the person supporting the roll cuts the plastic with a knife.
- d. The roll can be placed on the floor while plastic is centered and unfolded over the object.
- e. Tuck in the bottom edges or secure with staples, twine, or other appropriate method.

VII. GLOSSARY

TERM	DEFINITION
Grommets	Brass rings placed in the hem. Used for securing or hanging covers.
“S” Hooks	1/8” rods, 7 inches long and bent into an “S” shape. They are sharply pointed at one end. The throat of the hook has a 1½” opening.
“2” Hooks	1/8” rods, 7 inches long and bent into a “2” shape. They are sharply pointed at one end. The throat of the hook has a 1½” opening. Additional options for use exist with this alternate shape