RAY DOWNEY'S

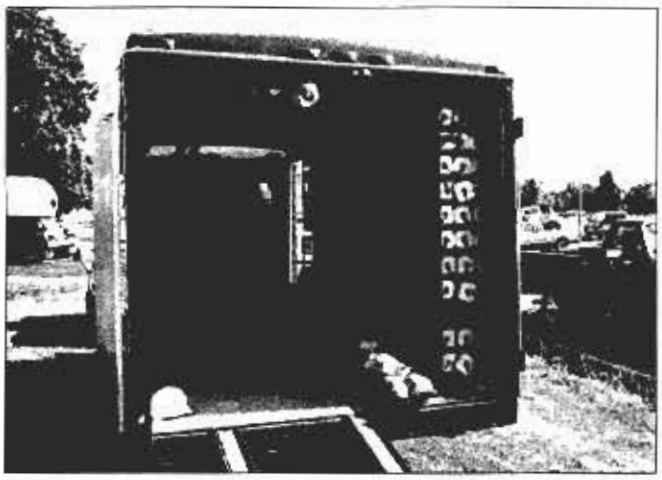
THE RESCUE COMPANY

BURIED VICTIMS, PART 2

GOVERNMENT regulations require minimum dimension and maximum spacing standards for trench shoring (see chart on page 21). Some states have gone beyond the minimum safety standards by requiring more stringent regulations. However, there are still some contractors who do not comply with any of the regulations, posing problems for rescuers in buried victim removal operations. As the requirements for trench shoring indicate, safety standards are designed to protect the workers, and contractors who fail to comply with these requirements endanger not only their workers but rescuers who may be called to the scene.

Shoring of excavation sites by contractors usually involves using 2- or 3-inch-thick planks butted tightly together as uprights to form a solid sheeting, which is then held in place by wales—braces that are placed horizontally against the sheeting—and shoring. In addition, wales transmit loading from the sheeting to shores. Shoring is when timber, trench, screw, air, or hydraulic jacks are used to hold the sheeting against the trench walls. Some major contractors also use solid, preformed panels (manufacturers use materials of varying strengths in order to comply with government regulations). Because of the panels' size and weight, heavy equipment is usually required to place and remove them.

If you are called to a scene involving a buried victim where the contractor has complied with the required regulations, you will be able to determine the size, depth, and width of the trench or exca-



The Fairfax (VA) Fire and Rescue Cave-In Unit carries most of the materials necessary for a successful buried victim operation. (Photos by Fairfax Fire and Rescue Department.)

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vation by either conferring with the person in charge or by using the blueprints or plans for the job. Often these job sites will have additional shoring materials readily available in the event that rescuers require them.

But more often than not, rescuers must improvise and make do with what they have at their disposal on such calls. What are the alternatives if the necessary materials are not immediately available?

MAKE THE MOST OF AVAILABLE RESOURCES

Units should have a list of suppliers (lumber yards, contractor and building supply yards, and so on) within or near their response area. Arrange with these suppliers to procure materials in the event of an incident either by picking up the materials or having the supplier deliver them to the scene. Contrary to popular belief, many contractors and suppliers are more than generous when asked to aid fire service personnel involved in such incidents.

An awareness of building and construction site locations in your response area is another good resource for rescuers. Many of these sites have materials that can be used for shoring or sheeting. Rescue units should compile a list of sites in their area and include it in preplans.

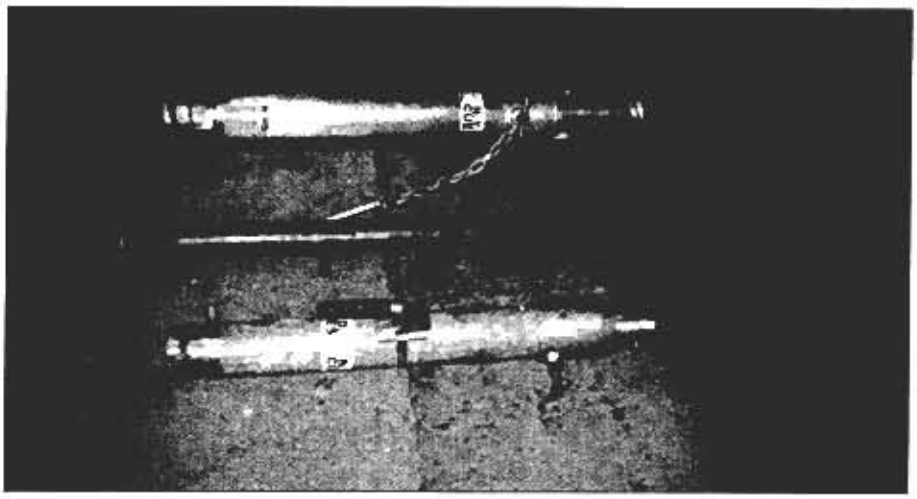
Many heavy-rescue units carry various tools and equipment that can be used at buried victim incidents. Screw or trench jacks, Jimmi Jaks, and hydraulic and pneumatic shores are usually part of rescue units' inventory of equipment and can be used as trench shoring. Knowing the limitations and capabilities of these devices, however, is a must. For example, it is recommended that screw or trench jacks not be used in trenches wider than five feet unless two of these jacks are used side by side. It is also good to know that air shores, which are activated by either CO_2 or compressed air, come in seven different sizes, adapt to all types of trenches, and are approved by OSHA.

If your unit does not have the necessary room to carry such tools and equipment, store them in quarters or in a central location so they can be delivered to the incident scene by another unit or by vehicles capable of carrying the equipment. (For more on tools and

Shoring at the job site is typically vertical or horizontal heavy timber. Some contractors are using preformed metal panels, wales, braces, and shores. (Photos by author.)

equipment, see "The Rescue Company," *Fire Engineering*, September '88.)

A number of departments have formed specialized cave-in units, trench rescue units, and collapse units by utilizing pick-up trucks or full-size trailers. Such apparatus is equipped with the various tools, equipment, and materials needed for trench rescue, cave-in, and collapse operations. When requested, on-duty personnel can deliver the special apparatus to the scene. These units should be designed to carry the heavy timbers, sheeting, tools, equipment, and appliances that can be used in all buried victim incidents.



Shown are various jack assemblies that serve as effective shoring materials. They are either mechanically, pneumatically, or hydraulically operated. (Photo by author.)

HAVE A WELL-STOCKED UNIT

The following is a list of various materials, tools, and equipment that specialized units carry. Some units carry much more than others; what's important is for a unit to make the most of its

TRENCH SHORING—MINIMUM REQUIREMENTS

Depth of kind or condition of earth trench		Size and spacing of members										
		Uprights		Stringers		Cross braces[1]						
		Minimum dimension	Maximum spacing	Minimum dimension	Maximum spacing	Width of trench: Up to 3 feet	3 to 6 feet	6 to 9 feet	9 to 12 feet	12 to 15 feet	Maximum spacing: Vertical	Horizontal
Feet	Condition	Inches	Feet	Inches	Feet	Inches	Inches	Inches	Inches	Inches	Feet	Feet
5 to 10	Hard, compact	3×4 or 2×6	6	.....	.....	2×6	4×4	4×6	4×6	6×8	4	6
	Likely to crack	3×4 or 2×6	3	4×6	4	2×6	4×4	4×6	4×6	6×8	4	6
	Soft, sandy, or filled	3×4 or 2×6	Close sheeting	4×6	4	4×4	4×6	6×6	6×8	8×8	4	6
	Hydrostatic pressure	3×4 or 2×6	Close sheeting	6×8	4	4×4	4×6	6×6	6×8	8×8	4	6
10 to 15	Hard	3×4 or 2×6	4	4×6	4	4×4	4×6	6×6	6×8	8×8	4	6
	Likely to crack	3×4 or 2×6	2	4×6	4	4×4	4×6	6×6	6×8	8×8	4	6
	Soft, sandy, or filled	3×4 or 2×6	Close sheeting	4×6	4	4×6	6×6	6×8	8×8	8×10	4	6
	Hydrostatic pressure	3×6	Close sheeting	8×10	4	4×6	6×6	6×8	8×8	8×10	4	6
15 to 20	All kinds or conditions	3×6	Close sheeting	4×12	4	4×12	6×8	8×8	8×10	10×10	4	6
Over 20	All kinds or conditions	3×6	Close sheeting	6×8	4	4×12	8×8	8×10	10×10	10×12	4	6

[1]Trench jacks may be used in lieu of, or in combination with, cross braces.
Shoring is not required in solid rock, hard shale, or hard slag.
Where desirable, steel sheet piling and bracing of equal strength may be substituted for wood.

BURIED VICTIMS, PART 2

department's available resources.

- Plywood panels (4'×8'×1¼") for sheeting.
- Preformed panels, usually made of multilayered fiberglass (4'×8'×1" or ¾") for sheeting.
- Planking 2"×12"×12' long, for uprights.
- Ground pads—4'×8'×¼" plywood.
- Timbers of various lengths (4"×4"/ 6"×6"/ 8"×8") for shoring.
- Screw or trench jacks.
- Air and hydraulic shores.
- Jimmi Jaks.
- Saws: chainsaws; power saws (wood, metal, and masonary blades); sawsall; circular saw; hand saws; hacksaws; heavy-duty drill and bits; and hole saws.
- Hand tools such as hammers, nails, sledgehammers, pinch and wrenching bars, shovels, and trenching tools.
- Plastic pails or buckets.
- Rope—various sizes and lengths.
- Slings and harnesses.
- Generators, lights, extension cords, hand lights, electrical junction boxes.
- Lineman gloves and clampstick.
- Dewatering pumps and hoses.
- Utility blower and extension tube.
- Monitoring equipment—O_2, CO, explosive meters, and so on.
- Flares, traffic cones, and flags.
- Ladders—both straight and extension.
- First-aid equipment—resuscitator, stretchers, and backboards.
- Safety equipment—helmets, hard hats, gloves, and safety glasses.
- Tripods, hauling systems, pulleys, and block and tackle.
- Cooler for water or energy drink.

A number of items can be added to this list. Established units may already have many of these items and more. New units should stock up as best as their budget allows. Ingenuity often makes up for a lack of materials or equipment.

Remember, most buried victim incidents are time-consuming operations. When setting the game plan into operation, utilize all available resources, ensure the safety of all rescuers, and have a contingency plan. ■