TIEMS 2014 USA Conference in Hattiesburg, Mississippi
21 – 23 July, 2014
University of Southern Mississippi, Hattiesburg, Mississippi, USA

Recognizing and Removing Barriers Preventing Utilization of Demolition and Debris Removal Resources During a Disaster Response

T. R. Stahr
Senior Consultant, Environmental Resources Management

R.R. Rapp and M. Shaurette
Department of Building Construction Management, Purdue University

ABSTRACT

A modern professional industry exists with perfectly suited tools and equipment, appropriate and comprehensive training, and a wealth of day-to-day experience to safely, rapidly, and effectively assist with rescue, recovery and clean-up operations, and with very few exceptions this industry's resources go largely untapped during large-scale disasters in the United States.

This paper briefly describes a number of problems common to many disaster recoveries, the resources and skills possessed by private demolition companies and their suitability on a disaster site, the artificial barriers in place that discourage the demolition industry's full cooperation during large-scale disaster responses, suggested considerations for change, and the potential benefits of removing those barriers to encourage more active participation by the demolition industry as a whole.

Key Words: Demolition, Skilled Support Providers, Private-Industry,

1. INTRODUCTION

In spite of the heroic efforts of first responders and the massive outpouring of support in terms of funding, equipment, and manpower from areas outside of a particular disaster, there are often a number of problems that in hindsight are common to many large-scale disasters. These problems include technical incompetence, short-term health and safety issues, delayed or long drawn-out recoveries, and long-term health issues.

Many private companies that participate in a disaster response will be doing so for the first time. In a very understandable desire to help others and to participate in the recovery of their homes and communities, private companies often provide services on disaster sites for which they have little or no experience. Certainly, the conditions under which they are providing the services are often new and filled with unexpected hazards. The lack of experience with conditions on a disaster site combined with the desire to participate in the recovery often result in companies taking on tasks that they are not competent to perform.

Disaster sites are by their very nature unpredictable and dangerous. In addition to the normal hazards found when doing any type of construction work, workers on disaster sites are confronted with unusual and often unpredictable hazards: A building's structural stability may be compromised; fall hazards, sharp objects, and unstable debris piles may be present, normally non-friable asbestos contained in pipe wrap, floor tile, or mastic may be both unrecognizable and more hazardous at a disaster site because of the conditions, etc. Workers who might normally be able to recognize and avoid exposure to the hazards may not have the experience to do so on a disaster site. Other hazards like lead, asbestos, chemicals, radiological, etc. are often present and go unrecognized simply because workers have no experience dealing with them.

A worker's lack of knowledge and experience dealing with hazards typically found on a disaster site can often lead to both short-term health and safety risks, as well as long-term, chronic health issues. However, a worker's lack of knowledge or recognition of a hazard is only part of the problem. Workers must also be both trained in the proper use of PPE to protect against hazards, and be experienced in using the PPE. Often workers who are not trained in the proper use of their PPE use it in a way that is ineffective at protecting them from the hazard. Those who are not accustomed to

wearing PPE both for extended periods of time, and while performing whatever tasks they are assigned often remove or discard the PPE because it is perceived as more of a burden than a protection.

Respiratory protection is an example of a type of PPE that disaster workers are often trained on for the first time upon their arrival at a disaster site. The use of APRs (air-purifying respirators) requires that the worker be medically tested to ensure that they are capable of wearing the PPE for an extended period and performing their duties without causing themselves physical harm. This testing is often neglected for disaster site workers without training and experience.

Many studies have been done on the after-effects of these types of problems after large-scale disasters, and we are still counting the costs in the hundreds of millions or billions of dollars from many of the effects. Two studies about the long-term health effects after 9/11 may be found at the following links:

http://www.nyc.gov/html/doh/wtc/html/know/know.shtml

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2587652/

2. Demolition Industry Basics and Suitability as Disaster Site Workers

Demolition contractors in the United States are not all the same. Demolition companies include owner-operators specializing in single-family home demolitions, along with companies that employ hundreds of workers and have many areas of expertise from power plant demolition, to asbestos abatement, to implosions.

Regardless of size or specific areas of specialization, demolition companies all have certain day-to-day experiences in common. They specialize in the safe and efficient demolition or dismantlement of various types of structures. They own and maintain equipment specifically designed and built for the purpose of carrying out the work of a demolition company and are capable of the transportation, maintenance and support of that equipment. They are adept at moving large amounts of debris very quickly. Demolition company employees are knowledgeable and experienced in the identification, transport and disposal of all types of waste, including special and hazardous waste and are familiar with all of the regulatory requirements. And finally, demolition company employees are trained and experienced in dealing with the hazards associated with demolition work and large-scale debris movement.

Figure 1. Backhoe with shear attachment

Demolition companies own equipment specifically designed for the demolition and removal of structures. This equipment includes backhoes with specialized attachments such as shears (Figure 1), processors, or grapples; loaders capable of moving and loading out huge amounts of debris, bull-dozers, skid steers, and a host of other equipment to support their demolition activities from fences, to power generators, to fuel tanks, to water tankers.

Demolition contractors typically own the heavy duty trucks needed to transport that equipment and the tools to maintain it and are familiar with the various permitting processes needed to move equipment and material from one place to another.

Baseline training for demolition workers typically includes basic and advanced PPE (Figure 2), working at heights and fall protection, confined space work (arguably of unrecognized significance at a disaster site), lead in construction, asbestos awareness, first aid/CPR, HAZWOPER (Hazardous Waste Operations and Emergency Response), equipment usage and many other types of basic training.

In addition to basic and advanced safety training, most demolition workers are also subject to baseline medical screening including drug testing, respirator fit-tests, and blood-lead level/ZPP testing to ensure that the training and equipment they receive is being used, and is effective in preventing exposure to various hazards.

Given the day-to-day experience, training, and capabilities of the average demolition contractor, there is no single industry group better prepared to safely and effectively assist with many aspects of disaster recovery from the removal of debris, to the removal of structures.

Figure 2. Demolition workers in PPE

3. Barriers to Full Industry Participation

A number of the contractors who performed demolition work in New York City after the 9/11 tragedy are no longer in business as a result of their experience on the disaster site. Their experiences and the issues they had and failed to overcome, including the loss or sale of their companies in some cases, have largely soured the industry on work of this type.

The current methods of selecting and engaging private companies to assist with disaster recoveries are themselves responsible in part, for the problems listed above as common to those recoveries.

Private companies that participate in response activities must comply with a number of restrictions and requirements in order to contract with publically funded authorities. These requirements are often in place because of perceived short-term economic savings, or political gain. These requirements change depending on the specifics of the disaster, but they often have similar characteristics. For example contractors must have a business license in the state where the work takes place; contractors are required to pay employees a certain amount per hour (and will be compensated at that rate); contractors must employ a set number or percentage of local employees, etc.

Characteristics that would typically be required of a private company when engaged by a client or owner are rarely required for disasters., They should include such minimum qualifications as a demonstration of appropriate past experience in the form of references, acceptable levels of insurance and bonding capabilities, OSHA safety logs, insurance company experience modification rates (EMR), safety programs and training, appropriate PPE, and equipment and training designed specifically for the assigned tasks, are rarely required.

The lack of these types of requirements when public agencies or publically funded authorities contract with private companies often results in companies participating in the response work who are able to meet the stated requirements but have little or no experience with the type of work contracted for, employees and workers with little or no experience performing the tasks required using safety equipment that they have not been properly trained to use, with equipment not suited for the work.

In fact, due specifically to the requirements of working for public agencies or publically funded authorities stated above, those contractors not affected by the disaster, and therefore able to assist most effectively with the response, are actively discouraged from participating.

If, for example, one of the nation's leading demolition contractors from Chicago, with a division specializing in emergency response work, had been asked to participate in recovery efforts in New Orleans, to be paid for by a government funded body, the company would have needed to consider a number of imposed conditions prior to accepting the work. They would (1) be required to hire a significant percentage of local labor (typically with no experience in disaster or demolition work) in order to be awarded a contract; (2) they would only be compensated 1/3 of the cost of the labor that they bring to the disaster site (because of the difference in local prevailing wages compared to wages paid in their home areas); (3) they may or may not be compensated for the maintenance and upkeep of the equipment they use during the recovery efforts; (4) the rate paid for their equipment would not cover the cost of operating the equipment to perform demolition work; and (4) they would likely have an extremely long waiting period prior to being compensated. In addition, they would have to significantly disrupt their ongoing contractual obligations in order to support the response effort. For most companies, this is not a sustainable behavior, and therefore they would choose not to participate.

Perhaps the biggest barrier to the industry's full participation is a lack of consistent protection from liability. Demolition contractors working under the authority of first responders at a disaster site are often forced to accept a level of liability that they would not be exposed to in the normal course of business. For example, if a demolition company in the US, in the interests of public safety, is called upon to demolish a building that is severely compromised structurally, and during the course of that demolition damage is caused to surrounding structures, regardless of whether or not there was an

alternative method of demolition, that demolition company could be exposed to legal action by the damaged building's insurance company.

Any one of the barriers mentioned above; low or unsustainable rates for equipment or personnel, long payment terms, forced hiring of local labor, or unlimited liability would be enough to discourage a contractor's participation. Taken together, these factors are enough to discourage an entire industry, one whose services should be in high demand, and whose lack of participation has an uncalculated but high cost in the long term.

One of the keys to the participation of more skilled companies in disaster responses is the formation of cooperative agreements made prior to a disaster. A study of Hurricane Katrina confirms that it is inappropriate to await a disaster to integrate essential capabilities into a synergistic plan of response. "Overwhelmed during a crisis and unfamiliar with emergent actors, incident commanders lack the time to learn what emergent capacities are on offer." (Moynihan, 2009, p. 902)

Laying the groundwork before trouble strikes is imperative. From their wide experience in disaster response, the U.S. Army Corps of Engineers ". . . *uses pre-awarded contracts that can be quickly activated for missions such as water, ice, temporary roofing, generator installation and debris management*." (USACE, 2014) The imperatives that compel advance agreements for the more common commodities and services lead one to conclude that quick and effective action from construction specialty contractors might also be secured with pre-agreements or pre-awarded contracts.

4. Components of Cooperation Agreements

The key elements of any cooperative agreements have been suggested during discussion of homeland security preparation (Behling, Orczyk, & Shaurette, 2007). The elements suggested include:

- Government entities responsible for first response must contract with private contractors in advance of a disaster.
- Contractors are under the command and control of first responders.
- Contractors are reimbursed on an hourly basis for labor and equipment at pre-determined rates.
- Rates of compensation should adjust depending on the home location of the contractor when necessary, and the prevailing wage in the area where the workers are normally based.
- Contractors are reimbursed for materials consumed.
- Contractors are afforded liability protections.

In order to minimize the reluctance of contractors to participate from a risk management perspective, it will be necessary to provide indemnification to the contractors participating in the disaster response. This should be a logical step because the skilled support personnel will be acting under the direction of first responders (typically government agencies) who may already enjoy some immunity in the execution of their response to the disaster. Contractual provisions should be made to underscore that the contractors are working for the 'first responder' as an extension of their resources.

Preplanning will require anticipation of numerous indefinite details. Because it is impossible to fully predict what work may be needed to facilitate a disaster response, it is suggested that the scope of work be limited to provision for labor and equipment on an hourly basis. It is paramount that contractors be confident that they will be fairly and justly compensated for their contributions. While some contractors may be willing to absorb a 'donation' of labor and equipment to what many would view as a humanitarian effort, most will be unable to risk their livelihood to assist in a disaster response.

To avoid disputes over reimbursement to contractors for expenditures incurred, advance disaster response agreements must anticipate all of the costs incurred by a contractor working in cooperation with a first responder. It is important that contractors get paid for any equipment that is summoned by the first responders but not directly placed into service. This mobilization and lost productive time reimbursement should be in addition to labor, materials and equipment actually consumed. The National Demolition Association has been active in developing model agreements between local fire departments and demolition contractors including what amounts to a work authorization form. These model agreements clarify the following critical issues:

- Who will pay the contractor for their work?
- Who will direct the contractor in their work?
- Unit pricing for all labor and equipment both brought to, and/or used on the site or to support the work at the site (e.g. equipment mechanics, industrial hygienists, medical monitoring costs, testing and sampling of materials etc.).
- Liability assumed by the contractor, if any beyond gross misconduct.
- When the contractor's service and the terms under which they are performing for the public body are considered complete.
- Any minimums or limits to the number of men, or the types and number of equipment a contractor is committed to provide.

- Any time frames under which the contractor is expected to mobilize, and perform the work.

Contractors participating in the disaster response will incur home office management costs to support whatever is done in the field. Contractors should be allowed to recoup their general and administrative costs through an overhead charge. Profit should also be allowed to help offset the lost opportunity cost of not having their resources employed in a for-profit project (Shaurette, Rapp, & Stahr, 2014).

5. Summary and Conclusion

There exists in the US an industry whose day-to-day experience, capability and training make it ideally suited to be a fundamental part of any disaster response, and to a great extent the industry at large chooses not to participate in disaster response activities for the federal government, or for government funded authorities.

The industry's lack of participation primarily centers on a few key points that to a large extent are artificially created and integrated into the first response community's contractor selection and engagement process.

The key barriers to full participation by the industry include unlimited liability, forced hiring of local labor, equipment and labor compensation rates based on inaccurate or inappropriate data, unrealistic limits on what expenses are reimbursable, and lengthy payment terms.

At the heart of these barriers is a desire to save money in the short-term by paying contractors lower rates for equipment and labor, and limiting what contractors can charge under their contract. In addition to the monetary justifications are political justifications, e.g. the forcing of contractor to hire a percentage of local labor in order to obtain a contract.

It is often the case that the market for qualified local labor is already stretched far beyond its capacity during a disaster. The result is that the only labor left to consider for employment by an outside contractor is wholly untrained and often unsuitable for the type of work undertaken by demolition contractors. This exposes the employees to serious hazards to their health and well-being, and exposes the contractor to un-necessary workers compensation claims and other liability resulting from having untrained and unqualified workers in the field.

It is often these untrained workers who suffer the worst of the long-term health and safety effects at the expense of short-term monetary savings.

There seems little doubt that with the full cooperation and participation of the demolition industry, the problems, pitfalls, and expenses in terms of human health and dollars spent could be greatly improved.

REFERENCES

Behling, K., Orczyk, J. and Shaurette, M. (2007). The Civilian Construction Contractor Corps. Proceedings of the *Homeland Security: the ripple effect* conference hosted by the American Military University, Washington, DC.

Shaurette, M., Rapp, R., and Stahr, T. (May 2014) *First Responder/Private Industry Collaboration to Advance Disaster Response*. Components of Cooperation Agreements p. 4-5

Proceedings of the *10th International Conference of the International Institute for InfrastructureResilience and Reconstruction, 219-223*Moynihan, D.P. (2009). The Network Governance of Crisis Response: Case Studies of Incident Command Systems. JPART 19:895–915 Published by on behalf of the *Journal of Public Administration Research and Theory* (JPART). Oxford University Press, 19:895-915.

USACE. (2014). U.S. Army Corps of Engineers Emergency Response. Headquarters. http://www.usace.army.mil/Media/FactSheets/FactSheetArticleView/tabid/219/Article/156/emergency-response.aspx, accessed 4Apr14.