FACILITY REDUCTION PROGRAM DEMOLITION AND DECONSTRUCTION DATA COLLECTION ACTIVITY FOR CEHNC BEST PRACTICES TOOLBOX

(CONTRACT NO. W912DY-04-P-0076)

Task #4: Mobile Demolition Processing Team Feasibility Study

Final Report

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Toolbox Scope of Work Objectives

Part of FRP is a web based data and information utility, the Best Practices Toolbox, that can be used by Army base management personnel to determine the optimal approach to removing a given building, structure, or facility. The Toolbox contains photographs and descriptions of military and civilian-equivalent facilities that have been demolished or deconstructed. It provides general information and levels of sorting and selection according to building type, construction type, and acquisition method. The Toolbox also provides information concerning the effect of environmental issues and statistical data about recycling and reuse of materials. The User can select any level or class of data and ask the Toolbox to provide the optimal approach, cost, and schedule for the removal of a similar facility at the User's site. Or, the User can input source information into the Toolbox and ask for a more specific answer. This scope of work describes the requirements for a data collection and evaluation effort to provide input into the Toolbox data arrays and to provide analog data to be used in Toolbox calculations.

Task #4 Definition Mobile Demolition Processing Team Feasibility Study and Operation Schedule.

Task 4.1 - As part of the Data Collection effort in Task 2.0 the Contractor will determine if there is sufficient user demand to make a Demolition Processing Team concept economically viable and operationally practical. The Demolition Processing Team concept proposes to define and deploy a mobile unit that travels to predetermined IMA bases (TBD) for the purpose of grinding and pulverizing debris from construction and demolition projects; and spreading or stockpiling the material, if feasible; disposing of the material at an appropriate landfill, or selling the material if there is an economically feasible market; as appropriate.

Task 4.2 - Following the effort to determine the viability of the concept, the Contractor, upon direction of the Project Manager, shall develop a plan and schedule for the operation of the Demolition Processing Team. If feasible, the Team shall begin operation in September 2004, or as soon as possible, and continue through a date TBD in FY05.

Deliverable: The results of the feasibility study in report format. If determined to be feasible and notified to proceed with Task 4.2, Contractor will provide a statement of work, plan, and schedule for such a Demolition Processing Team.

TASK 4 DISCUSSION

Research Summary

The purpose of a Mobile Demolition Processing Team (MDPT) is to offer a service to Army installations that would more economically and efficiently process (grind, crush, compact) demolition materials remaining after an on-base demolition project. The processed materials would then be stored and/or used on base, sold for scrap/recycling, or deposited in an appropriate landfill so as to maximize waste stream diversion. The MDPT would travel to various demolition project sites, using specialized equipment, for the express purpose of processing the debris materials. There would be five categories of material processing:

1. Scrap Metals – removed from waste stream and sent to a recycler.
2. Clean Wood – Salvaged for reuse or ground to produce mulch materials for use as ground cover.
3. C & D Material – Ground to produce minimum volume for delivery to a landfill.
4. Concrete and concrete masonry units (CMU) – Crushed on-site for use as fill and road base.
5. Brick – Either salvaged for re-sale or crushed for use as fill material.
6. Asphalt – Crushed/ground for re-use as recycled asphalt or for road base.

Several demolition contracting firms were contacted and the unanimous consensus was that the MDPT concept would likely be impractical from a scheduling and cost savings perspective and unnecessary for the following reasons:

1. Demolition contractors are currently performing the above diversion/recycling operations whenever it is economically sound and/or directed by the client or other cognizant agency.
2. If the demolition contractor were not in control of the final disposition of the demolition materials, it is likely that buildings would be wrecked in the least expensive way, without regard to the end use or disposal of the materials.
3. There is always the possibility that 100% of the asbestos and, perhaps other materials considered hazardous, would not be removed prior to demolition. If such material was discovered during the MDPT operation, a costly and contentious cross liability situation could surface.

For the aforementioned reasons, it is our opinion that the MDPT concept is not practical and could not assure an overall project cost savings. It should be noted that the grinding, crushing and compacting of debris material is already performed on site or at a recycle center by demolition contractors. For this reason, the MDPT does not offer a technically superior alternative, only the possibility of economy of scale savings. In other words, using either MDPT or current demolition practices offers the same result, diverting recyclable demolition debris, as much as possible, from landfills. As a by-product of this study, the Contractor recommends mandating maximum recycling of demolition debris (requirements to be incorporated in the scope of work technical specifications section of future facility reduction projects).

Review of Current and Historical Practices

The specifications of a typical USACE demolition project allow the contractor considerable latitude as to how the by-products of demolition will be handled. Usually, the contractor will demolish a given structure in such a manner as to efficiently separate the various types of construction materials as the demolition project progresses. For example, a typical wood frame building would be first demolished down to the concrete slabs and foundations and the resulting debris would be processed by grinding with the tracks of heavy equipment, or using a portable debris grinder and then loaded into trucks for landfill disposal. During this operation, salvageable materials, such as useable timbers, scrap metals and brick would be separated from the waste stream and set aside for future sale and/or reuse. The concrete slabs and foundations would then be demolished and hauled to a recycler for crushing/reuse, crushed on site, and/or deposited in a suitable landfill, depending on the characterization of the debris. Asphalt driveways and other paved areas would be removed and hauled to a recycling firm.

Discussion of MDPT Operations

A typical USACE demolition project might require demolition of a number of buildings and other structures scattered over a large area. If the specifications required the demolition contractor to only demolish the structures and leave them for future processing and disposal, it is likely that the project site would be unsightly, and would possibly present a safety hazard, until the MDPT completed their work at a future time. The non-concrete materials, i.e. wood, drywall and other building materials, would have to be moved from the footprint of the building in order to access the concrete slabs and foundations: this operation requires an additional material handling step in the overall demolition process. Also, the effort by the demolition contractor to salvage building components would likely be minimal, even though the MDPT could be required to perform whatever salvaging operations that are deemed feasible.

An alternative for utilizing the MDPT concept would require the demolition contractor to move the demolished building materials to a stockpile area away from the primary installation activities. The MDPT operations could then be accomplished at a stockpile area. Sequence of operations could be as follows:

1. Demolition contractor demolishes the structure.
2. Demolition contractor trucks all demolition materials to a stockpile area.
3. Demolition contractor salvages useable building materials and scrap metals.
4. Demolition contractor completes building-site restoration.
5. Demolition contractor demobilizes.
6. MDPT mobilizes to site.
7. MDPT grinds debris for landfill disposal: either on post or to a commercial landfill.
8. MDPT crushes concrete and separates reinforcing steel and stockpiles material for use by the facility or sale to commercial interests.
9. MDPT crushes other materials such as CMU, brick and asphalt and places materials in stockpiles.
10. MDPT demobilizes and moves to the next site.

This procedure could limit the long-term problem of unsightly piles of rubble and potential safety hazards and allow the facility to accumulate the demolition materials over an extended time period that would increase the efficiency of the MDPT.

Issues for Consideration

1. If the MDPT concept is used, a means to separate potential debris/waste stream cross liability issues between the demolition contractor and the MDPT contractor must be established. (For example, if asbestos is inadvertently mixed into the demolition waste stream by the demolition contractor and is later discovered by the MDPT contractor, how will the liability be assessed and who will adjudicate? With only one contractor involved in the demolition, this potential problem is eliminated.)
2. For the MDPT concept to succeed, it is our belief that the following conditions must exist:
    a. A stockpile area, away from the primary activity areas of the facility, must be available.
    b. There must be enough demolition debris produced in a specified time period to warrant the cost of mobilizing the MDPT.
    c. The C & D disposal landfill must be equipped to handle volumes of demolition debris commiserate with the production rate of the MDPT operation.
3. If a facility anticipates several small demolition projects annually, the MDPT concept might be cost-effective insofar as the various demolition contractors would be able to eliminate the costs of multiple mobilizations of grinders and crushers.
4. Recycling and waste stream diversion techniques can be maximized using either the MDPT concept or traditional demolition material processing methods. This can be achieved by defining the goals of the project in the Scope of Work section of the contract specifications.

Conclusion

1. Existing standard practices in the demolition industry already divert as much demolition debris material as feasible from the waste stream entering landfills. Demolition contractors will salvage/divert as much recyclable material as possible in order to maximize their project revenues, thus keeping them profitable and more competitive in the market place. This competitive factor already works to squeeze project costs and promote the most economical technical demolition processes possible.
2. The theoretical economy-of-scale benefits from using a MDPT may not be possible in practice, given the effectiveness of debris processing techniques used by contractors today, the negative impact of cross-liability issues on demolition contractors, the lack of schedule predictability in many demolition projects, and the relatively low debris volume of many Army demolition projects. For one very large, or several combined large scale demolition projects in relatively close proximity to each other, the MDPT may be cost-effective, assuming the volume is sufficient and cross liability can be mitigated.

3. While researching this task, we noted that some concrete demolition debris from Army FRP projects is going directly to a landfill. It is our opinion that the most cost-effective way to immediately ensure the maximum reduction in the quantity of demolition materials entering landfills is to require Army demolition contractors to crush concrete, asphalt and masonry and make them available to the facility or local recyclers for reuse. This should also be the case for all demolition debris metals or any other items that have an economically practical recycling or reuse market. (On average, concrete and concrete products are estimated to comprise about 40% of the total demolition waste stream. In most areas within the country, there is a ready market for such material.)